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## PATENT ABSTRACTS OF JAPAN

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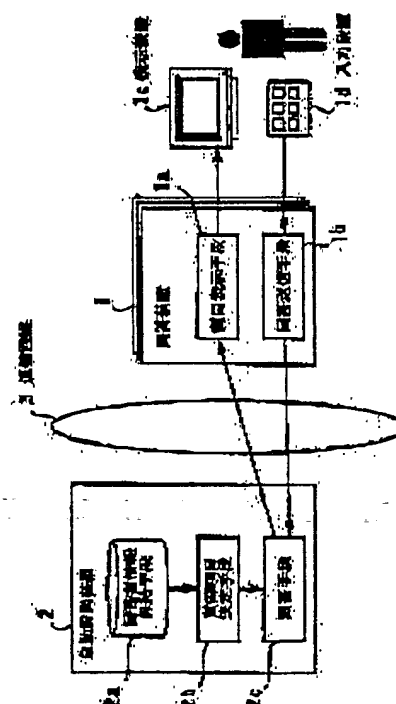
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(54) AUTOMATIC QUESTION ANSWERING SYSTEM, AUTOMATIC QUESTION DEVICE, AND STORAGE MEDIUM RECORDED WITH AUTOMATIC QUESTION PROGRAM

(57)Abstract:

PROBLEM TO BE SOLVED: To collect individual information from a plurality of patients without assistance.

SOLUTION: An answerer information holding means 2a holds the information on answerers and an asking item deciding means 2b decides asking items at every answerer based on the information held by the holding means 2a. A question-and-answer means 2c connects the channel to the answering devices 1 used by the answerers when a prescribed time comes, transmits questions to the answerers on the asking items decided by the deciding means 2, and receives answers to the questions from the answering devices 1. Thus, even when nobody exists on an automatic question-and-answer device 2 side, the questions to the answerers can be put automatically and the answers from the answerers can be collected automatically.



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CLAIMS

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[Claim(s)]

[Claim 1] In the automatic dialog system which performs automatically the question to the person who is present in a remote place, and acquisition of the reply from the person If the reply to the question displayed as a question display means to display the content of the sent question on a screen is inputted The reply equipment which has a reply transmitting means to return the inputted value as a reply to a question, A respondent information hold means to hold the information relevant to a respondent, and a question item decision means to determine the question item for every respondent based on the information stored in the aforementioned respondent information hold means, The automatic dialog system characterized by having the automatic question equipment which has a dialog means to receive the reply to a question while the question determined with the aforementioned question item decision means will be transmitted to the aforementioned reply equipment which a respondent uses, if it becomes predetermined time.

[Claim 2] In the automatic question equipment which argues between the reply equipments installed in the remote place, and acquires a reply of a question A respondent information hold means to hold the information relevant to a respondent, and a question item decision means to determine the question item for every respondent based on the information stored in the aforementioned respondent information hold means, Automatic question equipment characterized by having a dialog means to receive the reply to a question while the question determined with the aforementioned question item decision means will be transmitted to the aforementioned reply equipment which a respondent uses, if it becomes predetermined time.

[Claim 3] It is the automatic question equipment according to claim 2 which the aforementioned respondent information hold means holds the information which is useful to grasp of a respondent's eucrasia, and is characterized by what the question item for the aforementioned question item decision means giving an oral consultation is determined for according to a respondent's eucrasia.

[Claim 4] Automatic question equipment according to claim 2 characterized by having further a reply record means to store in the aforementioned respondent information hold means the result which is the dialog which the aforementioned dialog means performed as an information relevant to a respondent.

[Claim 5] Automatic question equipment according to claim 2 characterized by having further a significance distinction means to analyze the result which is the dialog which the aforementioned dialog means performed, and to distinguish significance.

[Claim 6] When it is judged by the aforementioned significance distinction means that it is important When it is judged by detailed question item decision means to determine the detailed question item according to the result which is the dialog which the aforementioned dialog means performed, and the aforementioned significance distinction means that it is important Automatic question equipment according to claim 5 characterized by having further a detailed matter dialog means to receive the reply to a question while the question determined with the aforementioned detailed question item decision means is transmitted.

[Claim 7] Automatic question equipment according to claim 4 characterized by having further the dialog result display means which carries out a screen display of the dialog result while carrying out highlighting of the dialog distinguished by the aforementioned significance distinction means as it is important.

[Claim 8] It is the automatic question equipment according to claim 2 which has further a schedule storage means by which the time which should argue was set up for every respondent, and is characterized by transmitting a question to the aforementioned reply equipment which a respondent uses if the aforementioned dialog means becomes the time set as the aforementioned schedule storage means.

[Claim 9] In the record medium which recorded the automatic question program for arguing between the reply equipments installed in the remote place, and acquiring a reply of a question and in which computer reading is possible It is based on the information stored in the respondent information hold means and the aforementioned respondent information hold means of holding the information relevant to a respondent. If it becomes the question item decision means and the predetermined time which determine the question item for every respondent, while the question determined with the aforementioned question item decision means will be transmitted to the aforementioned reply equipment which a respondent uses The record medium which recorded the automatic question program characterized by considering as a dialog means to receive the reply to a question, and operating a computer and in which computer reading is possible.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] In this invention, in order to perform the oral consultation to the patient cared for especially by being home about the record medium which recorded the automatic question program for making the automatic dialog system which argues automatically, the automatic question equipment which asks a question automatically, and an automatic question perform to a computer, a useful automatic dialog system, automatic question equipment, and an automatic question program are related to the recorded record medium.

[0002]

[Description of the Prior Art] Now, the home care aided system for making easy oral consultation of the patient who receives care is made from being home. In the home care aided system, the equipment for a communication is put on the both sides with the side cared for with the old people of being home. The equipment for a communication can connect a video camera and television, and it displays the sent picture image on the screen of television while it transmits the picture image which the video camera caught to the other party. Using this, both sides can talk by the ability seeing a real time picture, and can perform oral consultation etc.

[0003]

[Problem(s) to be Solved by the Invention] however, always \*\*\*\* [ to a center side / in a care worker ] with such a system -- if it kicks, it will not become, but a help will start In addition, in the conventional system, although there was also a system which collects informations, such as a blood-pressure value, automatically from patient's home, since it was what collects the uniform informations set up beforehand from two or more patients, it was able to be used only in order to collect general informations. Therefore, it was inadequate for collecting the detailed informations according to the eucrasia for every patient. [0004] this invention is made in view of such a point, and it aims at offering the automatic dialog system which can collect individual informations from two or more patients, without applying a help.

[0005] Moreover, other purposes of this invention are offering the automatic question equipment which performs the question for collecting individual informations from two or more patients, without applying a help. Moreover, another purpose of this invention is offering the record medium which recorded the automatic question program for making the question for collecting individual informations perform to a computer and in which computer reading is possible from two or more patients, without applying a help.

[0006]

[Means for Solving the Problem] The principle view of this invention is shown in drawing 1 . In the automatic dialog system which performs automatically the question to the person who is present in a remote place, and acquisition of the reply from the person in order to solve the above-mentioned technical problem in this invention If the reply to the question displayed as question display means 1a which displays the content of the sent question on a screen is inputted Reply transmitting means 1b which returns the inputted value as a reply to a question, The reply equipment 1 which \*\*\*\*s, and respondent information hold means 2a holding the information relevant to a respondent, Question item decision means 2b which determines the question item for every respondent based on the information stored in the aforementioned respondent information hold means 2a, If it becomes predetermined time, while the question of the question item which connects the circuit between the aforementioned reply equipments 1 which a respondent uses, and was determined by the aforementioned question item decision means 2b will be transmitted The automatic dialog system characterized by having the automatic question equipment 2 which has dialog means 2c which receives the reply to a question is offered.

[0007] If the information about each respondent is stored in respondent information hold means 2a of the automatic question equipment 2 according to such an automatic dialog system, the question item to each respondent will be determined by question item decision means 2b. And if it becomes predetermined time, a question will be transmitted by dialog means 2c to the reply equipment 1. The content of the transmitted question is displayed on the screen of display 1c by question display means 1a of the reply equipment 1. A respondent looks at the displayed question and inputs the reply by 1d of input units. The inputted value is sent to the automatic question equipment 2 by reply transmitting means 1b. The sent reply is received by dialog means 2c.

[0008] Moreover, in order to solve the above-mentioned technical problem, argue between the reply equipments installed in the remote place, and it sets to the automatic question equipment which acquires a reply of a question. Respondent

information hold means 2a holding the information relevant to a respondent, and question item decision means 2b which determines the question item for every respondent based on the information stored in the aforementioned respondent information hold means 2a, If it becomes predetermined time, the circuit between the aforementioned reply equipments 1 which a respondent uses will be connected, and while the question determined by the aforementioned question item decision means 2b is transmitted, the automatic question equipment 2 characterized by having dialog means 2c which receives the reply to a question is offered.

[0009] If the information about each respondent is stored in respondent information hold means 2a of the automatic question equipment 2 according to such automatic question equipment 2, the question item to each respondent will be determined by question item decision means 2b. And if it becomes predetermined time, a question will be transmitted by dialog means 2c to the reply equipment 1. If a reply is returned from the reply equipment 1 according to the transmitted question, the sent reply will be received by dialog means 2c.

[0010] Moreover, in order to solve the above-mentioned technical problem, argue between the reply equipments installed in the remote place, and it sets to the record medium which recorded the automatic question program for acquiring a reply of a question and in which computer reading is possible. It is based on the information stored in the respondent information hold means and the aforementioned respondent information hold means of holding the information relevant to a respondent. If it becomes the question item decision means and the predetermined time which determine the question item for every respondent, while the question determined with the aforementioned question item decision means will be transmitted to the aforementioned reply equipment which a respondent uses The record medium which recorded the automatic question program characterized by considering as a dialog means to receive the reply to a question, and operating a computer and in which computer reading is possible is offered.

[0011] If a computer is made to perform the automatic question program recorded on such a record medium, a function required for such automatic question equipment 2 will be built by the above-mentioned this invention on a computer.

[0012]

[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. Drawing 1 is a principle block diagram of this invention. The automatic dialog system of this invention consists of two or more reply equipments 1 and automatic question equipments 2 which were formed for every respondent. These equipments are mutually connected by the communication line 3.

[0013] Question display means 1a and reply transmitting means 1b are prepared in the reply equipment 1. Question display means 1a displays the content of the question sent from the automatic question equipment 2 on the screen of display 1c. In this case, if the image information like an animation is sent simultaneously with the content of a question from the automatic question equipment 2, the picture image will also be displayed on the screen of display 1c. 1d of input units will return the inputted value to the automatic question equipment 2 as a reply to a question, if the reply to the displayed question is inputted by 1d of input units.

[0014] Respondent information hold means 2a, question item decision means 2b, and dialog means 2c are prepared in the automatic question equipment 2. Respondent information hold means 2a holds the information relevant to a respondent. Question item decision means 2b determines the question item for every respondent based on the information stored in respondent information hold means 2a. If dialog means 2c becomes predetermined time, it will connect the circuit between the reply equipments 1 which a respondent uses, and it receives the reply to a question while it transmits the question of the question item determined by question item decision means 2b. In addition, in case a question is transmitted, image information, such as an animation, can be transmitted if needed.

[0015] If the information about each respondent is stored in respondent information hold means 2a of the automatic question equipment 2 according to such an automatic dialog system, the question item to each respondent will be determined by question item decision means 2b. And if it becomes predetermined time, a question will be transmitted by dialog means 2c to the reply equipment 1. The content of the transmitted question is displayed on the screen of display 1c by question display means 1a of the reply equipment 1. A respondent looks at the displayed question and inputs the reply by 1d of input units. The inputted value is sent to the automatic question equipment 2 by reply transmitting means 1b. The sent reply is received by dialog means 2c.

[0016] Thereby, even if a man is not in the automatic question equipment 2 side, the individual question for every respondent can be performed automatically, and the replies can be collected. The home care using the network can be efficiently performed by applying this automatic dialog system to a home care aided system. The home care system which provided below with this invention is explained.

[0017] Drawing 2 is drawing showing the configuration of a home care aided system. In this example, the home care system is built through ISDN (Integrated Services Digital Network)10.

[0018] The personal computer (it is henceforth called a "personal computer") 20 is formed in the care center side. The personal computer 20 is connected to ISDN10 through the control unit 31. A control unit 31 transmits the alphabetic information which shows the content of the question sent from the personal computer 20, and the image information from a down converter 32 to the control unit 41 by the side of a patient. Moreover, the information will be inputted into a personal computer 20 if the value which shows a reply of a question from a control unit 41 is sent. The down converter 32 is connected to the both sides of a personal computer 20 and the control unit 31. This down converter 32 changes into the transmission signal of a color broadcast the picture signal outputted from the personal computer, and passes it to a control unit 31. As a

transmission signal of color television, there is NTSC (National Television System Committee), for example. Furthermore, the video camera 33 is prepared for the care center side. A video camera 33 takes a photograph of a doctor's 34 picture image, and it is used in order to input the picture image into a personal computer 20.

[0019] The control unit 41 is connected to ISDN10 in the patient's home side. Television 42, the color CCD (Charge Coupled Device) camera 43, and the control unit for a communication 44 are connected to the control unit 41. A control unit 41 changes into the signal for television 42 the image information which is sent from a care center side through ISDN10, and came, and the content of a question, and sends them to television 42. Moreover, if a patient's 45 picture a photograph of was taken by color CCD camera 43 is sent to a control unit 41, a control unit 41 will change into a digital signal the picture signal sent from color CCD camera 43, and it will transmit to a care center side. Furthermore, a control unit 41 transmits the content of the key input by the control unit for a communication 44 to a care center side.

[0020] In such a home care aided system, in order to give an oral consultation to a patient, first, a doctor 34 uses a video camera 33 and records the question status to a patient on videotape. The information recorded on videotape is stored in the storage in a personal computer 20. Moreover, the schedule of the oral consultation to the patient of a plurality [ personal computer / 20 ] is registered. And if the time shown to the schedule comes, a personal computer 20 will start automatic oral consultation processing.

[0021] Drawing 3 is drawing showing the outline of automatic oral consultation processing.

[S1] If it becomes predetermined time, the personal computer 20 by the side of a care center will telephone patient's home automatically.

The [S2] patient 45 takes the earphone formed in the control unit for a communication 44.

The [S3] personal computer 20 specifies the oral consultation matter to a patient, and sends a doctor's 34 animation saved [ to patient's home ] at the question matter and the object for oral consultation of oral consultation.

[S4] A control unit 41 receives the sent animation and it displays on the screen of television 42. The content of a question of oral consultation is displayed on the lower part of this screen. Moreover, the alternative of the reply to a question is also displayed on the screen below. Each alternative is matched with the key of operation pad 44a prepared in the control unit for a communication 44.

[S5] patient inputs the reply to the question of oral consultation using operation pad 44a prepared in the control unit for a communication 44. The input is transmitted to a care center by the control unit 41.

The [S6] personal computer 20 receives the reply from patient's home, and stores it in storage. Here, if the key of an end was pushed, a personal computer 20 will end automatic oral consultation processing. Furthermore, if there is another question, the picture image for the question will be transmitted to patient's home. By repeating such a question, a patient's oral consultation is automatically executable. It will be necessary to give an oral consultation to a still detailed symptom by reply of oral consultation at this time. Then, an end of the oral consultation which was being planned first performs the following processings continuously.

[0022] Drawing 4 is drawing showing the outline of symptom exception automatic oral consultation processing.

The personal computer 20 by the side of [S11] care center analyzes the content of the reply sent from patient's home, and carves a symptom.

The [S12] personal computer 20 extracts the oral consultation collection corresponding to the symptom judged at step S11 out of the oral consultation table currently prepared according to the symptom. And the content of the oral consultation set as the extracted oral consultation collection is transmitted to patient's home one by one.

The control unit 41 by the side of patient's home which received the question according to [S13] symptom displays the content of a question on the screen of television.

If [S14] patient inputs a reply using operation pad 44a, the content will be sent to a care center.

The [S15] personal computer 20 receives the reply from patient's home, and stores it in storage.

[0023] The content of processing performed to below with the personal computer 20 by the side of a center is explained in detail. First, the oral consultation schedule setting technique for every patient is explained. An oral consultation schedule setup is performed using a safe call setting screen.

[0024] Drawing 5 is drawing showing a safe call setting screen. This is the safe call setting screen 50 to one patient "patient A." In addition, a setup by the safe call setting screen 50 is used not only grasp of a patient's eucrasia but in order to take a communication with a patient or to offer an information.

[0025] On the safe call setting screen 50, the schedule of oral consultation can be set up for every day of the week for one week. Furthermore, one day is divided into three time zones, the morning, an afternoon, and night. It is 12 hours from 0:00 a.m. in the morning in the morning, and is from 6:00 p.m. to 12:00 p.m. from 0:00 p.m. to 6:00 p.m. night in the afternoon. Thus, the oral consultation time setting field 51 is formed for every divided time zone.

[0026] Buttons 52-58 are formed in the lower part of the safe call setting screen 50. If the button 52 "O.K. of" was written is pushed, the content set up on the screen will be decided and the safe call setting screen 50 will close. If the button 53 "cancel of" was written is pushed, the safe call setting screen 50 will close, without updating the content of a setting. A push on the button 54 "a prohibition day setup of" was written displays the setting screen of the date which forbids automatic oral consultation. If the prohibition day of oral consultation is set up in the screen, even if the schedule of oral consultation is registered on the safe call setting screen 50, automatic oral consultation of a prohibition day will not be performed. For example, if a patient's going-out day is known beforehand, let the day be a prohibition day. A push on the button 55 "the copy

of" was written displays the copy place input screen of the content of a setting. If a copy place is inputted in the screen, the information specified at the time is stored temporarily to make a note. A push on the button 56 written as "Stick" sets the information stored in memory as the field specified at the time by pushing the button 55 of a "copy." A push on the button 57 "deletion of" was written deletes the content of the field specified at the time. A push on the button 58 "all deletion of" was written deletes all the content set as the safe call setting screen 50.

[0027] In order to set up oral consultation time on such a safe call setting screen 50, the mouse connected to the personal computer 20 is operated, and a mouse pointer is moved to the field of the target time zone. And a click of the button of a mouse displays a safe call time input screen.

[0028] Drawing 6 is drawing showing a safe call time input screen. The start-time input section 61 is formed in the safe call time input screen 60. The check boxes 61a and 61b for choosing the morning and an afternoon are formed in the start-time input section 61. the right of the check boxes 61a and 61b -- "-- text box 61c for setting up " when, and "-- text box 61d for setting up " is prepared

[0029] The regeneration picture image specification part 62 is formed in the bottom of the start-time input section 61. There is text box 62a for inputting the file name of an image file in the regeneration picture image specification part 62. Button 62b "reference of" was written is prepared in the right, if this button 62b is pushed, the file name stored in storage, such as a hard disk drive unit, can be referred to, and the file name of the file chosen there will be set as text box 62a. Button 62c "test regeneration of" was written on the right-hand side of button 62b is prepared. A push on this button 62c reproduces the animation of the file specified by text box 62a.

[0030] Under the regeneration picture image specification part 62, the content specification part 63 of oral consultation is. Check box 63a of whether to give an oral consultation after a safe call (for patient's home to be telephoned and for it to only serve offering an information) is prepared in the content specification part 63 of oral consultation. With checking this check box 63a, automatic oral consultation can be performed after a safe call. Text box 63b for inputting the modality of oral consultation is prepared in the bottom of check box 63a. If the modality of oral consultation is inputted into this text box 63b, the corresponding automatic oral consultation will be performed.

[0031] Two buttons 64 and 65 are formed in the lower part of the safe call time input screen 60. A push on the button 64 "O.K. of" was written registers into a safe call setting screen the content set as the safe call time input screen 60.

[0032] In such a safe call time input screen 60, if items, such as a start time, a regeneration picture image, and a modality of oral consultation, are inputted and the button 64 of "O.K." is pushed, the inputted content will be registered into the safe call setting screen 50.

[0033] In addition, various animations can be set up as a regeneration picture image. For example, you may set up the animation which took a photograph of the mode of a town. If the mode of a town is shown to the patient who cannot go out, the feeling of an isolation from society can be softened.

[0034] Moreover, the modality of oral consultation is divided as follows. Drawing 7 is drawing showing a sort of an oral consultation collection. As oral consultation of an initial stage, there are basic oral consultation 71 and individual oral consultation 72. A very general question like "whether it is feverish" is set to the basic oral consultation 71. The question by the patient individual is set to the individual oral consultation 72. Furthermore, the detailed oral consultation 73-79 by the symptom is prepared.

[0035] Flowing of processing performed within the personal computer 20 at the time of performing the automatic oral consultation to one patient "the A" where such an oral consultation collection of various kinds is stored in the storage of a personal computer 20 is shown below.

[0036] Drawing 8 is drawing showing flowing of automatic oral consultation with a personal computer.

The staff, such as a doctor by the side of [S21] care center, sets up the schedule of a safe call with the screen shown in drawing 5 and the drawing 6 . The content of a setting is call time, a regeneration picture, a question item, etc.

If it always supervises whether the [S22] personal computer 20 became the time of the set-up safe call and it becomes the time of a safe call about it, the vital sign data before the A (information which shows the eucrasia acquired from oral consultation or an actual physical examination performed in the past) will be checked. Vital sign data are blood pressure, a pulse, temperature, electrocardio, \*\*\*\*, etc. If there are not there result and abnormalities, the basic oral consultation and individual oral consultation which were set up beforehand will be chosen. If abnormalities are found, the oral consultation collection according to the symptom will be chosen. For example, if abnormalities are found in blood pressure, the oral consultation collection about the symptom of a circulatory organ will be chosen.

The oral consultation collection chosen at the [S23] step S22 is determined as an oral consultation item.

[S24] A Mr. \*\* is telephoned.

Waiting and oral consultation are started for the [S25] A taking an earphone.

If the oral consultation by the symptom was determined as a [S26] oral-consultation item, the oral consultation will be performed.

If [S27] oral-consultation item is determined as basic oral consultation, basic oral consultation will be performed.

If [S28] oral-consultation item is determined as individual oral consultation, the oral consultation currently prepared individually will be performed.

The content of a reply of [S29] basic oral consultation or individual oral consultation is analyzed, and it judges whether it is normal. When abnormalities are found, the detailed oral consultation according to the symptom is chosen. For example, when



a reply which shows the morbus of an urinary-organs system is returned, the detailed oral consultation 77 about the symptom of urinary organs is chosen.

When detailed oral consultation is chosen at the [S30] step S29, the corresponding oral consultation is performed.

A reply of the oral consultation by which [S31] operation was carried out is recorded on storage.

[0037] Thus, automatic oral consultation is performed. Since all recorded replies are recorded, the doctor who operates a personal computer 20 can refer to them freely. Drawing 9 is drawing showing the oral consultation record display screen. The patient information-display section 81 is formed in the oral consultation record display screen 80. Each information on a home registrant number, a patient name, an oral consultation day, and start/finish time is displayed on the patient information-display section 81.

[0038] The reply display 82 is formed in the bottom of the patient information-display section 81. In accordance with the order of oral consultation, the content of oral consultation and the alternative of the reply to the oral consultation are displayed on the reply display 82. Of the alternative of a reply, the monochrome fraction by which inverse video is carried out is the reply which the patient actually chose. Moreover, the content of a display of the reply display 82 is classified [ by color ] and displayed according to significance. the example of drawing -- \*\* -- purple and a little important oral consultation are yellow, and red and the important oral consultation of ordinary oral consultation are [ important oral consultation ] black. Thus, the reply with a problem can be recognized at a glance by changing and carrying out highlighting of the color of important oral consultation.

[0039] The diagnostic result display 83 is formed in the bottom of the reply display 82. The result which analyzed the reply of oral consultation is displayed on the diagnostic result display 83. The content of a display of the diagnostic result display 83 as well as the reply display 82 is classified [ by color ] and displayed according to significance.

[0040] At the lower right of the oral consultation record display screen 80, the button 84 written as "It closes" is formed, and if this button 84 is pushed, the oral consultation record display screen 80 will close. Such oral consultation record display screen 80 can also be automatically displayed based on a diagnostic result, although a doctor can also make it display by ordering to a personal computer 20. for example, a diagnostic result -- it is -- the maximum -- when it is judged that it is important, the oral consultation record display screen 80 is displayed on the display of a personal computer 20.

[0041] As mentioned above, an oral consultation can be automatically given to every patient by applying the automatic dialog system of this invention to a home care aided system. Consequently, the burden of the doctor and the staff who stand by to a care center side is mitigated. This is effective as a solution to the shortage of an absolute number of a helper accompanied by the increase in future old people.

[0042] And since the schedule of automatic oral consultation can be set up for every patient, it can use for making life rhythms, such as old people of German \*\*\*\*\*. That is, if the schedule of automatic oral consultation is doubled with each patient's rising time, the time same every morning will be telephoned at a patient side. Thereby, a patient can lead a regular life. And in order to use the picture image which carried out video \*\*\*\* beforehand in the case of automatic oral consultation, the staff, such as a helper, does not need to be standing by in the care center. That is, the automated system operation by the side of a care center becomes possible, and the labor shortage of the public health nurse or a helper can be canceled.

[0043] Moreover, since the question matter of oral consultation and the alternative of a reply were displayed on the screen, a patient should just push the keypad corresponding to the reply item prepared beforehand. Thus, even if it is the patient who has resistance to a new machine like old people by the ability inputting a reply very easily, a reply can be inputted satisfactory. In addition, a reply can also be inputted with voice by giving a speech recognition function to the control unit by the side of patient's home.

[0044] Moreover, arbitrarily, since it can set up, the picture image transmitted to patient's home can offer various informations simultaneously with automatic oral consultation. For example, the rehabilitation information which suited for every patient can be transmitted, or various informations, such as a message from the event information on an area, a medical checkup information, news, the mode of a town, and an acquaintance, can be displayed on television of patient's home.

[0045] In addition, the processing facility performed with the above-mentioned personal computer 20 is described by computer by the program recorded on the record medium which can be read, and is realized by making a personal computer 20 perform the program. As a record medium which can be read, there are a magnetic recording medium, semiconductor memory, etc. by computer. When circulating a commercial scene, it is CD-ROM (Compact Disk Read Only Memory). To portability type record media, such as a floppy (registered trademark) disk, store a program, and it is circulated, or it stores in the storage equipment connected through the network, and can also transmit to other computers through a network. In case it performs by computer, the program is stored in the hard disk drive unit in a computer etc., and it loads to main memory and performs.

[0046] Finally, the hardware configuration of the personal computer 20 for this invention being realized is explained.

Drawing 10 is a hardware block diagram of a personal computer. This personal computer is constituted focusing on CPU (Central Processing Unit)21. CPU21 controls the various devices connected through the bus 28 while it performs various processings based on the program memorized by memory 22. The following peripheral devices are connected to the bus 28.

[0047] A display controller 23 sends the picture image which generated and generated the display image according to the drawing instruction sent from CPU21 to display 23a. Display 23a connected to the display controller 23 displays the picture image sent from the display controller 23 on a screen.

[0048] Keyboard 24a and mouse 24b are connected, and the input device interface 24 transmits the input signal from

keyboard 24a or mouse 24b to CPU21.

[0049] It connects with the control unit by the side of a care center, and a communication interface 25 controls the data communication between control units. That is, while the data sent from CPU21 are transmitted to a control unit, the data sent from the control unit are received and CPU21 is passed.

[0050] HDD (Hard Disk Drive) Storage 26a, such as a hard disk drive unit, is connected to the controller 26, and I/O of the data to storage 26a is controlled. The system program which CPU21 should perform, the automatic oral consultation schedule data, the oral consultation table, the automatic oral consultation program, etc. are stored in storage 26a.

[0051] The video capture board 27 changes into digital image data the video signal sent from a video camera or a control unit. The changed image data is stored in storage 26a.

[0052] By performing an automatic oral consultation program with the personal computer 20 of such a configuration, the automatic oral consultation system using the personal computer 20 can be built. by the way -- although the above-mentioned explanation explains the case where automatic oral consultation is performed by the telephone from a care center side -- patient \*\*\*\* -- since -- a care center can be telephoned and automatic oral consultation can also be performed In this case, the personal computer 20 by the side of a care center judges the telephone from which patient it is by the telephone number of patient's home etc. If a patient is specified, an oral consultation item will be determined based on the patient's vital sign data etc., and automatic oral consultation will be performed. Also in this case, neither the doctor nor the helper needs to be standing by to the care center side.

[0053]

[Effect of the Invention] In order to determine that the question item for every respondent explained above by the question item decision means in the automatic dialog system of this invention and for the question item to perform the dialog between respondents automatically, an automatic question equipment side can perform the individual dialog between respondents while it can be employed by uninhabited.

[0054] Moreover, with the automatic question equipment of this invention, since a question item decision means determines the question item for every respondent and the question of the question item was transmitted to reply equipment, the individual question to a respondent can be performed automatically and the reply can be obtained.

[0055] Moreover, in the record medium which recorded the automatic question program of this invention and in which computer reading is possible, by making a computer perform the recorded automatic question program, a question item decision means determines the question item for every respondent, and it becomes possible to make processing which transmits the question of the question item to reply equipment perform to a computer.

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[Translation done.]

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TECHNICAL FIELD

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[The technical field to which invention belongs] In this invention, in order to perform the oral consultation to the patient cared for especially by being home about the record medium which recorded the automatic question program for making the automatic dialog system which argues automatically, the automatic question equipment which asks a question automatically, and an automatic question perform to a computer, a useful automatic dialog system, automatic question equipment, and an automatic question program are related to the recorded record medium.

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**PRIOR ART**

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[Description of the Prior Art] Now, the home care aided system for making easy oral consultation of the patient who receives care is made from being home. In the home care aided system, the equipment for a communication is put on the both sides with the side cared for with the old people of being home. The equipment for a communication can connect a video camera and television, and it displays the sent picture image on the screen of television while it transmits the picture image which the video camera caught to the other party. Using this, both sides can talk by the ability seeing a real time picture, and can perform oral consultation etc.

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**EFFECT OF THE INVENTION**

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[Effect of the Invention] In order to determine that the question item for every respondent explained above by the question item decision means in the automatic dialog system of this invention and for the question item to perform the dialog between respondents automatically, an automatic question equipment side can perform the individual dialog between respondents while it can be employed by uninhabited.

[0054] Moreover, with the automatic question equipment of this invention, since a question item decision means determines the question item for every respondent and the question of the question item was transmitted to reply equipment, the individual question to a respondent can be performed automatically and the reply can be obtained.

[0055] Moreover, in the record medium which recorded the automatic question program of this invention and in which computer reading is possible, by making a computer perform the recorded automatic question program, a question item decision means determines the question item for every respondent, and it becomes possible to make processing which transmits the question of the question item to reply equipment perform to a computer.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] however, always \*\*\*\* [ to a center side / in a care worker ] with such a system -- if it kicks, it will not become, but a help will start In addition, in the conventional system, although there was also a system which collects informations, such as a blood-pressure value, automatically from patient's home, since it was what collects the uniform informations set up beforehand from two or more patients, it was able to be used only in order to collect general informations. Therefore, it was inadequate for collecting the detailed informations according to the eucrasia for every patient. [0004] this invention is made in view of such a point, and it aims at offering the automatic dialog system which can collect individual informations from two or more patients, without applying a help. [0005] Moreover, other purposes of this invention are offering the automatic question equipment which performs the question for collecting individual informations from two or more patients, without applying a help. Moreover, another purpose of this invention is offering the record medium which recorded the automatic question program for making the question for collecting individual informations perform to a computer and in which computer reading is possible from two or more patients, without applying a help.

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MEANS

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[Means for Solving the Problem] The principle view of this invention is shown in drawing 1. In the automatic dialog system which performs automatically the question to the person who is present in a remote place, and acquisition of the reply from the person in order to solve the above-mentioned technical problem in this invention. If the reply to the question displayed as question display means 1a which displays the content of the sent question on a screen is inputted. Reply transmitting means 1b which returns the inputted value as a reply to a question, The reply equipment 1 which \*\*\*\*s, and respondent information hold means 2a holding the information relevant to a respondent, Question item decision means 2b which determines the question item for every respondent based on the information stored in the aforementioned respondent information hold means 2a, If it becomes predetermined time, while the question of the question item which connects the circuit between the aforementioned reply equipments 1 which a respondent uses, and was determined by the aforementioned question item decision means 2b will be transmitted. The automatic dialog system characterized by having the automatic question equipment 2 which has dialog means 2c which receives the reply to a question is offered.

[0007] If the information about each respondent is stored in respondent information hold means 2a of the automatic question equipment 2 according to such an automatic dialog system, the question item to each respondent will be determined by question item decision means 2b. And if it becomes predetermined time, a question will be transmitted by dialog means 2c to the reply equipment 1. The content of the transmitted question is displayed on the screen of display 1c by question display means 1a of the reply equipment 1. A respondent looks at the displayed question and inputs the reply by 1d of input units. The inputted value is sent to the automatic question equipment 2 by reply transmitting means 1b. The sent reply is received by dialog means 2c.

[0008] Moreover, in order to solve the above-mentioned technical problem, argue between the reply equipments installed in the remote place, and it sets to the automatic question equipment which acquires a reply of a question. Respondent information hold means 2a holding the information relevant to a respondent, and question item decision means 2b which determines the question item for every respondent based on the information stored in the aforementioned respondent information hold means 2a, If it becomes predetermined time, the circuit between the aforementioned reply equipments 1 which a respondent uses will be connected, and while the question determined by the aforementioned question item decision means 2b is transmitted, the automatic question equipment 2 characterized by having dialog means 2c which receives the reply to a question is offered.

[0009] If the information about each respondent is stored in respondent information hold means 2a of the automatic question equipment 2 according to such automatic question equipment 2; the question item to each respondent will be determined by question item decision means 2b. And if it becomes predetermined time, a question will be transmitted by dialog means 2c to the reply equipment 1. If a reply is returned from the reply equipment 1 according to the transmitted question, the sent reply will be received by dialog means 2c.

[0010] Moreover, in order to solve the above-mentioned technical problem, argue between the reply equipments installed in the remote place, and it sets to the record medium which recorded the automatic question program for acquiring a reply of a question and in which computer reading is possible. It is based on the information stored in the respondent information hold means and the aforementioned respondent information hold means of holding the information relevant to a respondent. If it becomes the question item decision means and the predetermined time which determine the question item for every respondent, while the question determined with the aforementioned question item decision means will be transmitted to the aforementioned reply equipment which a respondent uses. The record medium which recorded the automatic question program characterized by considering as a dialog means to receive the reply to a question, and operating a computer and in which computer reading is possible is offered.

[0011] If a computer is made to perform the automatic question program recorded on such a record medium, a function required for such automatic question equipment 2 will be built by the above-mentioned this invention on a computer.

[0012]

[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing. Drawing 1 is a principle block diagram of this invention. The automatic dialog system of this invention consists of two or more reply equipments 1 and automatic question equipments 2 which were formed for every respondent. These equipments are mutually connected by the communication line 3.

[0013] Question display means 1a and reply transmitting means 1b are prepared in the reply equipment 1. Question display

means 1a displays the content of the question sent from the automatic question equipment 2 on the screen of display 1c. In this case, if the image information like an animation is sent simultaneously with the content of a question from the automatic question equipment 2, the picture image will also be displayed on the screen of display 1c. 1d of input units will return the inputted value to the automatic question equipment 2 as a reply to a question, if the reply to the displayed question is inputted by 1d of input units.

[0014] Respondent information hold means 2a, question item decision means 2b, and dialog means 2c are prepared in the automatic question equipment 2. Respondent information hold means 2a holds the information relevant to a respondent. Question item decision means 2b determines the question item for every respondent based on the information stored in respondent information hold means 2a. If dialog means 2c becomes predetermined time, it will connect the circuit between the reply equipments 1 which a respondent uses, and it receives the reply to a question while it transmits the question of the question item determined by question item decision means 2b. In addition, in case a question is transmitted, image information, such as an animation, can be transmitted if needed.

[0015] If the information about each respondent is stored in respondent information hold means 2a of the automatic question equipment 2 according to such an automatic dialog system, the question item to each respondent will be determined by question item decision means 2b. And if it becomes predetermined time, a question will be transmitted by dialog means 2c to the reply equipment 1. The content of the transmitted question is displayed on the screen of display 1c by question display means 1a of the reply equipment 1. A respondent looks at the displayed question and inputs the reply by 1d of input units. The inputted value is sent to the automatic question equipment 2 by reply transmitting means 1b. The sent reply is received by dialog means 2c.

[0016] Thereby, even if a man is not in the automatic question equipment 2 side, the individual question for every respondent can be performed automatically, and the replies can be collected. The home care using the network can be efficiently performed by applying this automatic dialog system to a home care aided system. The home care system which provided below with this invention is explained.

[0017] Drawing 2 is drawing showing the configuration of a home care aided system. In this example, the home care system is built through ISDN (Integrated Services Digital Network)10.

[0018] The personal computer (it is henceforth called a "personal computer") 20 is formed in the care center side. The personal computer 20 is connected to ISDN10 through the control unit 31. A control unit 31 transmits the alphabetic information which shows the content of the question sent from the personal computer 20, and the image information from a down converter 32 to the control unit 41 by the side of a patient. Moreover, the information will be inputted into a personal computer 20 if the value which shows a reply of a question from a control unit 41 is sent. The down converter 32 is connected to the both sides of a personal computer 20 and the control unit 31. This down converter 32 changes into the transmission signal of a color broadcast the picture signal outputted from the personal computer, and passes it to a control unit 31. As a transmission signal of color television, there is NTSC (National Television System Committee), for example. Furthermore, the video camera 33 is prepared for the care center side. A video camera 33 takes a photograph of a doctor's 34 picture image, and it is used in order to input the picture image into a personal computer 20.

[0019] The control unit 41 is connected to ISDN10 in the patient's home side. Television 42, the color CCD (Charge Coupled Device) camera 43, and the control unit for a communication 44 are connected to the control unit 41. A control unit 41 changes into the signal for television 42 the image information which is sent from a care center side through ISDN10, and came, and the content of a question, and sends them to television 42. Moreover, if a patient's 45 picture a photograph of was taken by color CCD camera 43 is sent to a control unit 41, a control unit 41 will change into a digital signal the picture signal sent from color CCD camera 43, and it will transmit to a care center side. Furthermore, a control unit 41 transmits the content of the key input by the control unit for a communication 44 to a care center side.

[0020] In such a home care aided system, in order to give an oral consultation to a patient, first, a doctor 34 uses a video camera 33 and records the question status to a patient on videotape. The information recorded on videotape is stored in the storage in a personal computer 20. Moreover, the schedule of the oral consultation to the patient of a plurality [ personal computer / 20 ] is registered. And if the time shown to the schedule comes, a personal computer 20 will start automatic oral consultation processing.

[0021] Drawing 3 is drawing showing the outline of automatic oral consultation processing.

[S1] If it becomes predetermined time, the personal computer 20 by the side of a care center will telephone patient's home automatically.

The [S2] patient 45 takes the earphone formed in the control unit for a communication 44.

The [S3] personal computer 20 specifies the oral consultation matter to a patient, and sends a doctor's 34 animation saved [ to patient's home ] at the question matter and the object for oral consultation of oral consultation.

[S4] A control unit 41 receives the sent animation and it displays on the screen of television 42. The content of a question of oral consultation is displayed on the lower part of this screen. Moreover, the alternative of the reply to a question is also displayed on the screen below. Each alternative is matched with the key of operation pad 44a prepared in the control unit for a communication 44.

[S5] patient inputs the reply to the question of oral consultation using operation pad 44a prepared in the control unit for a communication 44. The input is transmitted to a care center by the control unit 41.

The [S6] personal computer 20 receives the reply from patient's home, and stores it in storage. Here, if the key of an end was



pushed, a personal computer 20 will end automatic oral consultation processing. Furthermore, if there is another question, the picture image for the question will be transmitted to patient's home. By repeating such a question, a patient's oral consultation is automatically executable. It will be necessary to give an oral consultation to a still detailed symptom by reply of oral consultation at this time. Then, an end of the oral consultation which was being planned first performs the following processings continuously.

[0022] Drawing 4 is drawing showing the outline of symptom exception automatic oral consultation processing.

The personal computer 20 by the side of [S11] care center analyzes the content of the reply sent from patient's home, and carves a symptom.

The [S12] personal computer 20 extracts the oral consultation collection corresponding to the symptom judged at step S11 out of the oral consultation table currently prepared according to the symptom. And the content of the oral consultation set as the extracted oral consultation collection is transmitted to patient's home one by one.

The control unit 41 by the side of patient's home which received the question according to [S13] symptom displays the content of a question on the screen of television.

If [S14] patient inputs a reply using operation pad 44a, the content will be sent to a care center.

The [S15] personal computer 20 receives the reply from patient's home, and stores it in storage.

[0023] The content of processing performed to below with the personal computer 20 by the side of a center is explained in detail. First, the oral consultation schedule setting technique for every patient is explained. An oral consultation schedule setup is performed using a safe call setting screen.

[0024] Drawing 5 is drawing showing a safe call setting screen. This is the safe call setting screen 50 to one patient "patient A." In addition, a setup by the safe call setting screen 50 is used not only grasp of a patient's eucrasia but in order to take a communication with a patient or to offer an information.

[0025] On the safe call setting screen 50, the schedule of oral consultation can be set up for every day of the week for one week. Furthermore, one day is divided into three time zones, the morning, an afternoon, and night. It is 12 hours from 0:00 a.m. in the morning in the morning, and is from 6:00 p.m. to 12:00 p.m. from 0:00 p.m. to 6:00 p.m. night in the afternoon. Thus, the oral consultation time setting field 51 is formed for every divided time zone.

[0026] Buttons 52-58 are formed in the lower part of the safe call setting screen 50. If the button 52 "O.K. of" was written is pushed, the content set up on the screen will be decided and the safe call setting screen 50 will close. If the button 53 "cancel of" was written is pushed, the safe call setting screen 50 will close, without updating the content of a setting. A push on the button 54 "a prohibition day setup of" was written displays the setting screen of the date which forbids automatic oral consultation. If the prohibition day of oral consultation is set up in the screen, even if the schedule of oral consultation is registered on the safe call setting screen 50, automatic oral consultation of a prohibition day will not be performed. For example, if a patient's going-out day is known beforehand, let the day be a prohibition day. A push on the button 55 "the copy of" was written displays the copy place input screen of the content of a setting. If a copy place is inputted in the screen, the information specified at the time is stored temporarily to make a note. A push on the button 56 written as "Stick" sets the information stored in memory as the field specified at the time by pushing the button 55 of a "copy." A push on the button 57 "deletion of" was written deletes the content of the field specified at the time. A push on the button 58 "all deletion of" was written deletes all the content set as the safe call setting screen 50.

[0027] In order to set up oral consultation time on such a safe call setting screen 50, the mouse connected to the personal computer 20 is operated, and a mouse pointer is moved to the field of the target time zone. And a click of the button of a mouse displays a safe call time input screen.

[0028] Drawing 6 is drawing showing a safe call time input screen. The start-time input section 61 is formed in the safe call time input screen 60. The check boxes 61a and 61b for choosing the morning and an afternoon are formed in the start-time input section 61. the right of the check boxes 61a and 61b -- "-- text box 61c for setting up " when, and "-- text box 61d for setting up " is prepared

[0029] The regeneration picture image specification part 62 is formed in the bottom of the start-time input section 61. There is text box 62a for inputting the file name of an image file in the regeneration picture image specification part 62. Button 62b "reference of" was written is prepared in the right, if this button 62b is pushed, the file name stored in storage, such as a hard disk drive unit, can be referred to, and the file name of the file chosen there will be set as text box 62a. Button 62c "test regeneration of" was written on the right-hand side of button 62b is prepared. A push on this button 62c reproduces the animation of the file specified by text box 62a.

[0030] Under the regeneration picture image specification part 62, the content specification part 63 of oral consultation is. Check box 63a of whether to give an oral consultation after a safe call (for patient's home to be telephoned and for it to only serve offering an information) is prepared in the content specification part 63 of oral consultation. With checking this check box 63a, automatic oral consultation can be performed after a safe call. Text box 63b for inputting the modality of oral consultation is prepared in the bottom of check box 63a. If the modality of oral consultation is inputted into this text box 63b, the corresponding automatic oral consultation will be performed.

[0031] Two buttons 64 and 65 are formed in the lower part of the safe call time input screen 60. A push on the button 64 "O.K. of" was written registers into a safe call setting screen the content set as the safe call time input screen 60.

[0032] In such a safe call time input screen 60, if items, such as a start time, a regeneration picture image, and a modality of oral consultation, are inputted and the button 64 of "O.K." is pushed, the inputted content will be registered into the safe call

setting screen 50.

[0033] In addition, various animations can be set up as a regeneration picture image. For example, you may set up the animation which took a photograph of the mode of a town. If the mode of a town is shown to the patient who cannot go out, the feeling of an isolation from society can be softened.

[0034] Moreover, the modality of oral consultation is divided as follows. Drawing 7 is drawing showing a sort of an oral consultation collection. As oral consultation of an initial stage, there are basic oral consultation 71 and individual oral consultation 72. A very general question like "whether it is feverish" is set to the basic oral consultation 71. The question by the patient individual is set to the individual oral consultation 72. Furthermore, the detailed oral consultation 73-79 by the symptom is prepared.

[0035] Flowing of processing performed within the personal computer 20 at the time of performing the automatic oral consultation to one patient "the A" where such an oral consultation collection of various kinds is stored in the storage of a personal computer 20 is shown below.

[0036] Drawing 8 is drawing showing flowing of automatic oral consultation with a personal computer.

The staff, such as a doctor by the side of [S21] care center, sets up the schedule of a safe call with the screen shown in drawing 5 and the drawing 6. The content of a setting is call time, a regeneration picture, a question item, etc.

If it always supervises whether the [S22] personal computer 20 became the time of the set-up safe call and it becomes the time of a safe call about it, the vital sign data before the A (information which shows the eucrasia acquired from oral consultation or an actual physical examination performed in the past) will be checked. Vital sign data are blood pressure, a pulse, temperature, electrocardio, \*\*\*\*, etc. If there are not there result and abnormalities, the basic oral consultation and individual oral consultation which were set up beforehand will be chosen. If abnormalities are found, the oral consultation collection according to the symptom will be chosen. For example, if abnormalities are found in blood pressure, the oral consultation collection about the symptom of a circulatory organ will be chosen.

The oral consultation collection chosen at the [S23] step S22 is determined as an oral consultation item.

[S24] A Mr. \*\* is telephoned.

Waiting and oral consultation are started for the [S25] A taking an earphone.

If the oral consultation by the symptom was determined as a [S26] oral-consultation item, the oral consultation will be performed.

If [S27] oral-consultation item is determined as basic oral consultation, basic oral consultation will be performed.

If [S28] oral-consultation item is determined as individual oral consultation, the oral consultation currently prepared individually will be performed.

The content of a reply of [S29] basic oral consultation or individual oral consultation is analyzed, and it judges whether it is normal. When abnormalities are found, the detailed oral consultation according to the symptom is chosen. For example, when a reply which shows the morbus of an urinary-organs system is returned, the detailed oral consultation 77 about the symptom of urinary organs is chosen.

When detailed oral consultation is chosen at the [S30] step S29, the corresponding oral consultation is performed.

A reply of the oral consultation by which [S31] operation was carried out is recorded on storage.

[0037] Thus, automatic oral consultation is performed. Since all recorded replies are recorded, the doctor who operates a personal computer 20 can refer to them freely. Drawing 9 is drawing showing the oral consultation record display screen. The patient information-display section 81 is formed in the oral consultation record display screen 80. Each information on a home registrant number, a patient name, an oral consultation day, and start/finish time is displayed on the patient information-display section 81.

[0038] The reply display 82 is formed in the bottom of the patient information-display section 81. In accordance with the order of oral consultation, the content of oral consultation and the alternative of the reply to the oral consultation are displayed on the reply display 82. Of the alternative of a reply, the monochrome fraction by which inverse video is carried out is the reply which the patient actually chose. Moreover, the content of a display of the reply display 82 is classified [ by color ] and displayed according to significance. the example of drawing -- \*\* -- purple and a little important oral consultation are yellow, and red and the important oral consultation of ordinary oral consultation are [ important oral consultation ] black. Thus, the reply with a problem can be recognized at a glance by changing and carrying out highlighting of the color of important oral consultation.

[0039] The diagnostic result display 83 is formed in the bottom of the reply display 82. The result which analyzed the reply of oral consultation is displayed on the diagnostic result display 83. The content of a display of the diagnostic result display 83 as well as the reply display 82 is classified [ by color ] and displayed according to significance.

[0040] At the lower right of the oral consultation record display screen 80, the button 84 written as "It closes" is formed, and if this button 84 is pushed, the oral consultation record display screen 80 will close. Such oral consultation record display screen 80 can also be automatically displayed based on a diagnostic result, although a doctor can also make it display by ordering to a personal computer 20. for example, a diagnostic result -- it is -- the maximum -- when it is judged that it is important, the oral consultation record display screen 80 is displayed on the display of a personal computer 20

[0041] As mentioned above, an oral consultation can be automatically given to every patient by applying the automatic dialog system of this invention to a home care aided system. Consequently, the burden of the doctor and the staff who stand by to a care center side is mitigated. This is effective as a solution to the shortage of an absolute number of a helper accompanied by

the increase in future old people.

[0042] And since the schedule of automatic oral consultation can be set up for every patient, it can use for making life rhythms, such as old people of German \*\*\*\*\*. That is, if the schedule of automatic oral consultation is doubled with each patient's rising time, the time same every morning will be telephoned at a patient side. Thereby, a patient can lead a regular life. And in order to use the picture image which carried out video \*\*\*\* beforehand in the case of automatic oral consultation, the staff, such as a helper, does not need to be standing by in the care center. That is, the automated system operation by the side of a care center becomes possible, and the labor shortage of the public health nurse or a helper can be canceled.

[0043] Moreover, since the question matter of oral consultation and the alternative of a reply were displayed on the screen, a patient should just push the keypad corresponding to the reply item prepared beforehand. Thus, even if it is the patient who has resistance to a new machine like old people by the ability inputting a reply very easily, a reply can be inputted satisfactory. In addition, a reply can also be inputted with voice by giving a speech recognition function to the control unit by the side of patient's home.

[0044] Moreover, arbitrarily, since it can set up, the picture image transmitted to patient's home can offer various informations simultaneously with automatic oral consultation. For example, the rehabilitation information which suited for every patient can be transmitted, or various informations, such as a message from the event information on an area, a medical checkup information, news, the mode of a town, and an acquaintance, can be displayed on television of patient's home.

[0045] In addition, the processing facility performed with the above-mentioned personal computer 20 is described by computer by the program recorded on the record medium which can be read, and is realized by making a personal computer 20 perform the program. As a record medium which can be read, there are a magnetic recording medium, semiconductor memory, etc. by computer. When circulating a commercial scene, it is CD-ROM (Compact Disk Read Only Memory). To portability type record media, such as a floppy (registered trademark) disk, store a program, and it is circulated, or it stores in the storage equipment connected through the network, and can also transmit to other computers through a network. In case it performs by computer, the program is stored in the hard disk drive unit in a computer etc., and it loads to main memory and performs.

[0046] Finally, the hardware configuration of the personal computer 20 for this invention being realized is explained. Drawing 10 is a hardware block diagram of a personal computer. This personal computer is constituted focusing on CPU (Central Processing Unit)21. CPU21 controls the various devices connected through the bus 28 while it performs various processings based on the program memorized by memory 22. The following peripheral devices are connected to the bus 28.

[0047] A display controller 23 sends the picture image which generated and generated the display image according to the drawing instruction sent from CPU21 to display 23a. Display 23a connected to the display controller 23 displays the picture image sent from the display controller 23 on a screen.

[0048] Keyboard 24a and mouse 24b are connected, and the input device interface 24 transmits the input signal from keyboard 24a or mouse 24b to CPU21.

[0049] It connects with the control unit by the side of a care center, and a communication interface 25 controls the data communication between control units. That is, while the data sent from CPU21 are transmitted to a control unit, the data sent from the control unit are received and CPU21 is passed.

[0050] HDD (Hard Disk Drive) Storage 26a, such as a hard disk drive unit, is connected to the controller 26, and I/O of the data to storage 26a is controlled. The system program which CPU21 should perform, the automatic oral consultation schedule data, the oral consultation table, the automatic oral consultation program, etc. are stored in storage 26a.

[0051] The video capture board 27 changes into digital image data the video signal sent from a video camera or a control unit. The changed image data is stored in storage 26a.

[0052] By performing an automatic oral consultation program with the personal computer 20 of such a configuration, the automatic oral consultation system using the personal computer 20 can be built. by the way -- although the above-mentioned explanation explains the case where automatic oral consultation is performed by the telephone from a care center side -- patient \*\*\*\* -- since -- a care center can be telephoned and automatic oral consultation can also be performed In this case, the personal computer 20 by the side of a care center judges the telephone from which patient it is by the telephone number of patient's home etc. If a patient is specified, an oral consultation item will be determined based on the patient's vital sign data etc., and automatic oral consultation will be performed. Also in this case, neither the doctor nor the helper needs to be standing by to the care center side.

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**DESCRIPTION OF DRAWINGS**

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[Brief Description of the Drawings]

- [Drawing 1] It is the principle block diagram of this invention.
- [Drawing 2] It is drawing showing the configuration of a home care aided system.
- [Drawing 3] It is drawing showing the outline of automatic oral consultation processing.
- [Drawing 4] It is drawing showing the outline of symptom exception automatic oral consultation processing.
- [Drawing 5] It is drawing showing a safe call setting screen.
- [Drawing 6] It is drawing showing a safe call time input screen.
- [Drawing 7] It is drawing showing a sort of an oral consultation collection.
- [Drawing 8] It is drawing showing flowing of automatic oral consultation within a personal computer.
- [Drawing 9] It is drawing showing the oral consultation record display screen.
- [Drawing 10] It is the hardware block diagram of a personal computer.

[Description of Notations]

- 1 Reply Equipment
- 1a Question display means
- 1b Reply transmitting means
- 1c Display
- 1d Input unit
- 2 Automatic Question Equipment
- 2a Respondent information hold means
- 2b Question item decision means
- 2c Dialog means
- 3 Communication Line

---

[Translation done.]

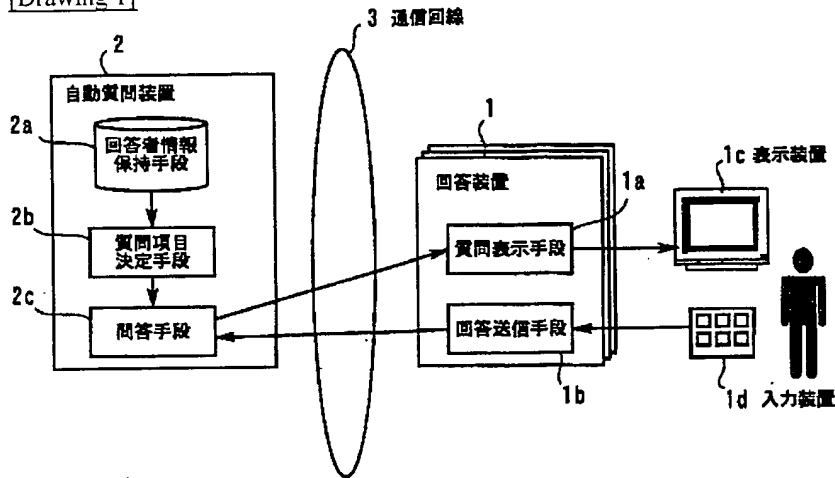
\* NOTICES \*

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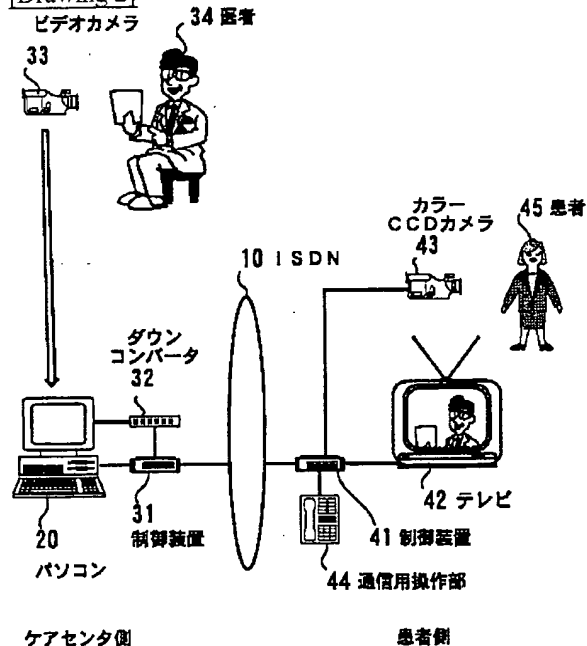
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

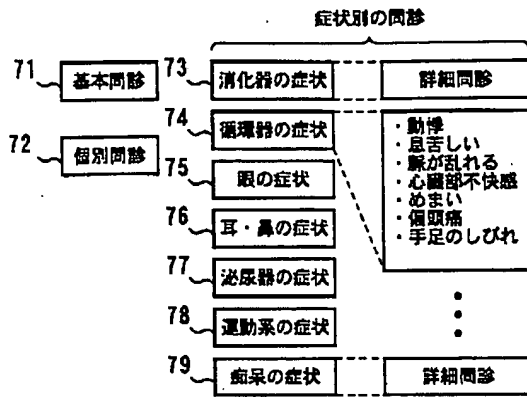
[Drawing 1]



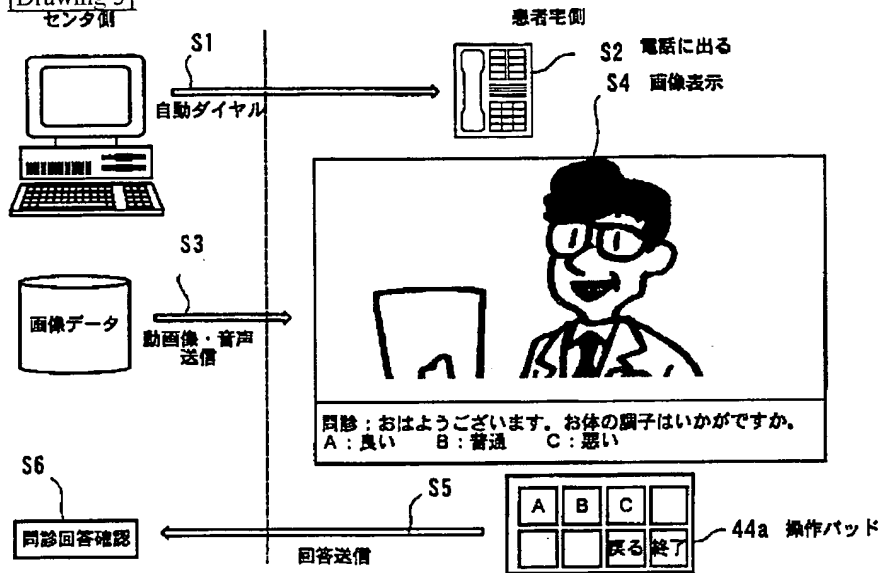
[Drawing 2]



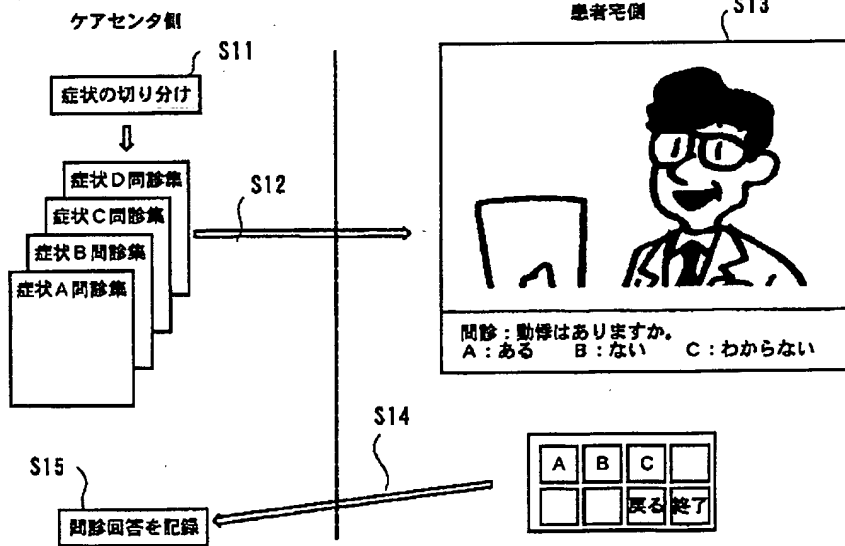
[Drawing 7]



[Drawing 3]  
センタ側



[Drawing 4]



[Drawing 5]

50 安心コール設定画面

安心コールの登録		Aさんのスケジュール				
日	月	火	水	木	金	土
	午前07時00分 同診する	午前07時00分 同診する	午前07時00分 同診する	午前07時00分 同診する	午前07時00分 同診する	午前07時00分 同診する
	午後01時00分 同診する		午後01時00分 同診する		午後01時00分 同診する	
			午後08時00分 同診する			
OK	キャンセル	禁止日設定	複写	張り付け	削除	全削除

52 53 54 55 56 57 58 51

[Drawing 6]

60

安心コール時刻入力画面

61 開始時刻

61a ☒ 午前

61b ☐ 午後

61c 00

61d 00

62 再生画像

62a ファイル名:

62b 参照

62c テスト再生

63 同診

63a ☒ 安心コール後、同診を行う

同診の種類:

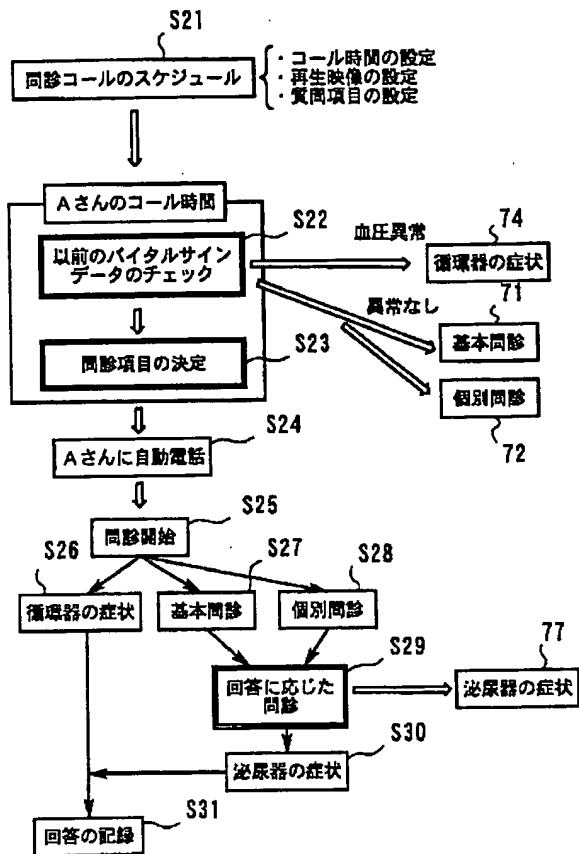
63b

OK

キャンセル

64 65

[Drawing 8]



[Drawing 9]

81

80

同診記録

在宅登録番号 : 00001

患者名 : Aさん

同診日 : 1998年05月04日

開始/終了時刻 : 18:08:44 ~ 18:09:39

赤色 : 最重要な同診  
紫色 : 重要な同診  
黄色 : やや重要な同診  
黒色 : 普通の同診

順番	同診内容	回答-A	回答-B	回答-C	その他の回答
0	おはようございます。体の調子はいかがですか。	悪い	普通	悪い	
1	今日、外出しますか。	する	しない	わからない	
2	心配事はありませんか。	ある	ない	わからない	
3	町の様子を見たいですか。	見たい	見たくない	わからない	
4	町の様子です。	まだみる	もう見ない	わからない	
5	利用者へ一言	終了			終了

診断 : 重要

閉じる

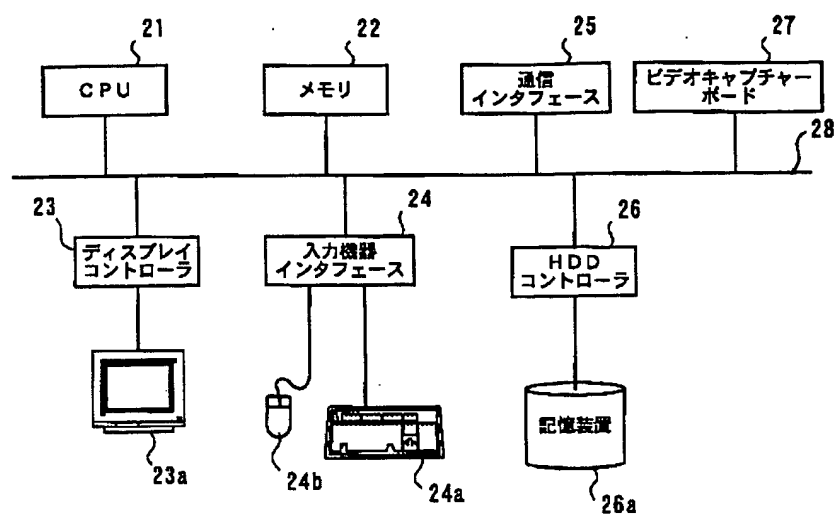
83

82

84

[Drawing 10]





[Translation done.]

(19)



JAPANESE PATENT OFFICE

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(71) Applicant: **FUJITSU LTD**

(72) Inventor: **WATABE NOBUYOSHI**  
**SHIMURA NOBUSHIRO**  
**USHIYAMA AKIYUKI**  
**HONMA MINORU**

(54) **AUTOMATIC QUESTION ANSWERING SYSTEM,  
AUTOMATIC QUESTION DEVICE, AND STORAGE  
MEDIUM RECORDED WITH AUTOMATIC  
QUESTION PROGRAM**

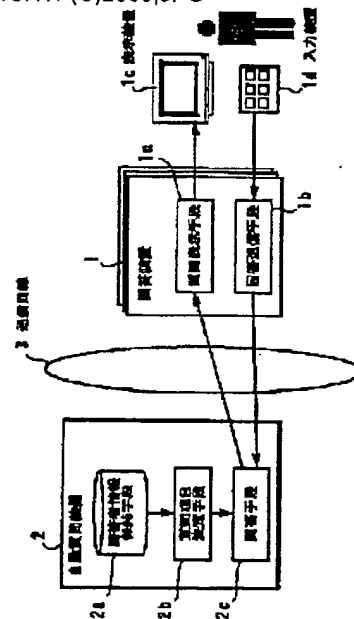
automatically and the answers from the answerers  
can be collected automatically.

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(57) Abstract:

PROBLEM TO BE SOLVED: To collect individual information from a plurality of patients without assistance.

SOLUTION: An answerer information holding means 2a holds the information on answerers and an asking item deciding means 2b decides asking items at every answerer based on the information held by the holding means 2a. A question-and-answer means 2c connects the channel to the answering devices 1 used by the answerers when a prescribed time comes, transmits questions to the answerers on the asking items decided by the deciding means 2, and receives answers to the questions from the answering devices 1. Thus, even when nobody exists on an automatic question-and-answer device 2 side, the questions to the answerers can be put



AC

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(P2000-148889A)

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(51) Int.Cl. <sup>7</sup>	識別記号	F I	テ-マ-ト (参考)
G 0 6 F 19/00		G 0 6 F 15/42	H
A 6 1 B 5/00	1 0 2	A 6 1 B 5/00	1 0 2 C

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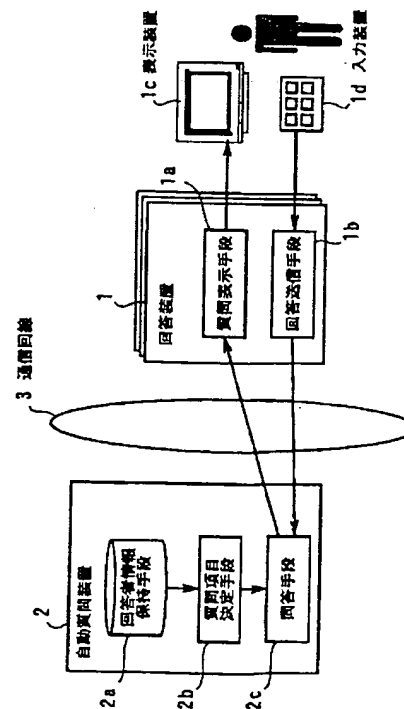
最終頁に続く

(54) 【発明の名称】 自動問答システム、自動質問装置及び自動質問プログラムを記録した記録媒体

(57) 【要約】

【課題】 人手をかけずに複数の患者から個別の情報を収集する。

【解決手段】 回答者情報保持手段2aは、回答者に関連する情報を保持する。質問項目決定手段2bは、回答者情報保持手段2aに格納されている情報に基づいて、回答者毎の質問項目を決定する。問答手段2cは、所定の時刻になると回答者の使用する回答装置1との間の回線を接続し、質問項目決定手段2bで決定された質問項目の質問を送信するとともに、質問に対する回答装置1からの回答を受け取る。これにより、自動質問装置2側に人がいなくても、回答者毎の個別の質問を自動的にを行い、その回答を収集することができる。



## 【特許請求の範囲】

【請求項1】 遠隔地にいる者への質問と、その者からの回答の取得とを自動的に行う自動問答システムにおいて、送られてきた質問の内容を画面に表示する質問表示手段と、表示された質問に対する回答が入力されると、入力された値を質問に対する回答として送り返す回答送信手段と、を有する回答装置と、回答者に関連する情報を保持する回答者情報保持手段と、前記回答者情報保持手段に格納されている情報に基づいて、回答者毎の質問項目を決定する質問項目決定手段と、所定の時刻になると回答者の使用する前記回答装置へ前記質問項目決定手段で決定された質問を送信するとともに、質問に対する回答を受け取る問答手段と、を有する自動問答装置と、を有することを特徴とする自動問答システム。

【請求項2】 遠隔地に設置された回答装置との間で問答を行い、質問の回答を取得する自動問答装置において、回答者に関連する情報を保持する回答者情報保持手段と、前記回答者情報保持手段に格納されている情報に基づいて、回答者毎の質問項目を決定する質問項目決定手段と、所定の時刻になると回答者の使用する前記回答装置へ前記質問項目決定手段で決定された質問を送信するとともに、質問に対する回答を受け取る問答手段と、を有することを特徴とする自動問答装置。

【請求項3】 前記回答者情報保持手段は、回答者の健康状態の把握に役立つ情報を保持しており、前記質問項目決定手段は、問診を行うための質問項目を回答者の健康状態に応じて決定すること、を特徴とする請求項2記載の自動問答装置。

【請求項4】 前記問答手段が行った問答の結果を、回答者に関連する情報として前記回答者情報保持手段に格納する回答記録手段をさらに有することを特徴とする請求項2記載の自動問答装置。

【請求項5】 前記問答手段が行った問答の結果を解析し、重要度を判別する重要度判別手段をさらに有することを特徴とする請求項2記載の自動問答装置。

【請求項6】 前記重要度判別手段によって重要であると判断された場合には、前記問答手段が行った問答の結果に応じた詳細質問項目を決定する詳細質問項目決定手段と、前記重要度判別手段によって重要であると判断された場合には、前記詳細質問項目決定手段で決定された質問を送信するとともに、質問に対する回答を受け取る詳細事項問答手段と、をさらに有することを特徴とする請求項5記載の自動問答装置。

【請求項7】 前記重要度判別手段によって重要と判別された問答を強調表示しながら問答結果を画面表示する問答結果表示手段をさらに有することを特徴とする請求項4記載の自動問答装置。

【請求項8】 問答を行うべき時刻が回答者毎に設定されたスケジュール記憶手段をさらに有し、前記問答手段は、前記スケジュール記憶手段に設定された時刻になると、回答者の使用する前記回答装置へ質問を送信することを特徴とする請求項2記載の自動問答装置。

【請求項9】 遠隔地に設置された回答装置との間で問答を行い、質問の回答を取得するための自動問答プログラムを記録したコンピュータ読み取り可能な記録媒体において、回答者に関連する情報を保持する回答者情報保持手段、前記回答者情報保持手段に格納されている情報に基づいて、回答者毎の質問項目を決定する質問項目決定手段、所定の時刻になると回答者の使用する前記回答装置へ前記質問項目決定手段で決定された質問を送信するとともに、質問に対する回答を受け取る問答手段、としてコンピュータを機能させることを特徴とする自動問答プログラムを記録したコンピュータ読み取り可能な記録媒体。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は自動的に問答を行う自動問答システム、自動的に質問を行う自動問答装置及び自動的な質問をコンピュータに行わせるための自動問答プログラムを記録した記録媒体に関し、特に在宅で介護された患者に対する問診を行うために有用な自動問答システム、自動問答装置及び自動問答プログラムを記録した記録媒体に関する。

## 【0002】

【従来の技術】現在、在宅で介護を受ける患者の問診を容易にするための在宅ケア支援システムが作られている。在宅ケア支援システムでは、在宅の高齢者と介護を行う側との双方にコミュニケーション用の装置が置かれている。コミュニケーション用の装置はビデオカメラとテレビとを接続でき、ビデオカメラが捉えた画像を相手側に送信するとともに、送られてきた画像をテレビの画面に表示する。これを用いて双方がリアルタイムな映像を見て会話をし、問診等を行うことができる。

## 【0003】

【発明が解決しようとする課題】しかし、このようなシステムでは、常にセンタ側に介護者がいなければならず、人手がかかってしまう。なお、血圧値等の情報を患者宅から自動収集するシステムもあるが、従来のシステムでは、予め設定された画一的な情報を複数の患者から収集するものであるため、一般的な情報を収集する目的でのみ使用することができた。したがって、患者毎の健

康状態に応じた詳細な情報を収集するには不十分であった。

【0004】本発明はこのような点に鑑みなされたものであり、人手をかけずに複数の患者から個別の情報を収集することができる自動問答システムを提供することを目的とする。

【0005】また、本発明の他の目的は、人手をかけずに複数の患者から個別の情報を収集するための質問を行う自動質問装置を提供することである。また、本発明の別の目的は、人手をかけずに複数の患者から個別の情報を収集するための質問をコンピュータに行わせるための自動質問プログラムを記録したコンピュータ読み取り可能な記録媒体を提供することである。

【0006】

【課題を解決するための手段】本発明の原理図を図1に示す。本発明では上記課題を解決するために、遠隔地にいる者への質問と、その者からの回答の取得とを自動的に行う自動問答システムにおいて、送られてきた質問の内容を画面に表示する質問表示手段1aと、表示された質問に対する回答が入力されると、入力された値を質問に対する回答として送り返す回答送信手段1bと、を有する回答装置1と、回答者に関連する情報を保持する回答者情報保持手段2aと、前記回答者情報保持手段2aに格納されている情報に基づいて、回答者毎の質問項目を決定する質問項目決定手段2bと、所定の時刻になると回答者の使用する前記回答装置1との間の回線を接続し、前記質問項目決定手段2bで決定された質問項目の質問を送信するとともに、質問に対する回答を受け取る問答手段2cと、を有する自動質問装置2と、を有することを特徴とする自動問答システムが提供される。

【0007】このような自動問答システムによれば、自動質問装置2の回答者情報保持手段2aに各回答者に関する情報を格納しておけば、質問項目決定手段2bにより各回答者に対する質問項目が決定される。そして、所定の時刻になると、問答手段2cにより、回答装置1に対して質問が送信される。送信された質問の内容は、回答装置1の質問表示手段1aによって表示装置1cの画面に表示される。回答者は、表示された質問を見て、その回答を入力装置1dによって入力する。入力された値は、回答送信手段1bによって自動質問装置2に送られる。送られた回答は、問答手段2cで受け取られる。

【0008】また、上記課題を解決するために、遠隔地に設置された回答装置との間で問答を行い、質問の回答を取得する自動質問装置において、回答者に関連する情報を保持する回答者情報保持手段2aと、前記回答者情報保持手段2aに格納されている情報に基づいて、回答者毎の質問項目を決定する質問項目決定手段2bと、所定の時刻になると回答者の使用する前記回答装置1との間の回線を接続し、前記質問項目決定手段2bで決定された質問を送信するとともに、質問に対する回答を受け

取る問答手段2cと、を有することを特徴とする自動質問装置2が提供される。

【0009】このような自動質問装置2によれば、自動質問装置2の回答者情報保持手段2aに各回答者に関する情報を格納しておけば、質問項目決定手段2bにより各回答者に対する質問項目が決定される。そして、所定の時刻になると、問答手段2cにより、回答装置1に対して質問が送信される。送信された質問に応じて回答装置1から回答が返されると、送られた回答が問答手段2cで受け取られる。

【0010】また、上記課題を解決するために、遠隔地に設置された回答装置との間で問答を行い、質問の回答を取得するための自動質問プログラムを記録したコンピュータ読み取り可能な記録媒体において、回答者に関連する情報を保持する回答者情報保持手段、前記回答者情報保持手段に格納されている情報に基づいて、回答者毎の質問項目を決定する質問項目決定手段、所定の時刻になると回答者の使用する前記回答装置へ前記質問項目決定手段で決定された質問を送信するとともに、質問に対する回答を受け取る問答手段、としてコンピュータを機能させることを特徴とする自動質問プログラムを記録したコンピュータ読み取り可能な記録媒体が提供される。

【0011】このような記録媒体に記録された自動質問プログラムをコンピュータに実行させれば、上記本発明にかかる自動質問装置2に必要な機能がコンピュータ上に構築される。

【0012】

【発明の実施の形態】以下、本発明の実施の形態を図面を参照して説明する。図1は、本発明の原理構成図である。本発明の自動問答システムは、回答者毎に設けられた複数の回答装置1と自動質問装置2とで構成される。これらの装置は、互いに通信回線3で接続されている。

【0013】回答装置1には、質問表示手段1aと回答送信手段1bとが設けられている。質問表示手段1aは、自動質問装置2から送られてきた質問の内容を表示装置1cの画面に表示する。この際、自動質問装置2から質問の内容と同時に動画のような画像情報が送られてきたら、その画像も表示装置1cの画面に表示する。入力装置1dは、表示された質問に対する回答が入力装置1dによって入力されると、入力された値を質問に対する回答として自動質問装置2へ送り返す。

【0014】自動質問装置2には、回答者情報保持手段2a、質問項目決定手段2b、問答手段2cが設けられている。回答者情報保持手段2aは、回答者に関連する情報を保持する。質問項目決定手段2bは、回答者情報保持手段2aに格納されている情報に基づいて、回答者毎の質問項目を決定する。問答手段2cは、所定の時刻になると回答者の使用する回答装置1との間の回線を接続し、質問項目決定手段2bで決定された質問項目の質問を送信するとともに、質問に対する回答を受け取る。

なお、質問を送信する際には、必要に応じて動画などの画像情報を送信することができる。

【0015】このような自動問診システムによれば、自動質問装置2の回答者情報保持手段2aに各回答者に関する情報を格納しておけば、質問項目決定手段2bにより各回答者に対する質問項目が決定される。そして、所定の時刻になると、問答手段2cにより、回答装置1に対して質問が送信される。送信された質問の内容は、回答装置1の質問表示手段1aによって表示装置1cの画面に表示される。回答者は、表示された質問を見て、その回答を入力装置1dによって入力する。入力された値は、回答送信手段1bによって自動質問装置2に送られる。送られた回答は、問答手段2cで受け取られる。

【0016】これにより、自動質問装置2側に人がいなくても、回答者毎の個別の質問を自動的にに行い、その回答を収集することができる。この自動問診システムを、在宅ケア支援システムに適用することにより、ネットワークを用いた在宅ケアを効率よく行うことができる。以下に、本発明を提供した在宅ケアシステムについて説明する。

【0017】図2は、在宅ケア支援システムの構成を示す図である。この例では、ISDN(Integrated Services Digital Network)10を介して在宅ケアシステムが構築されている。

【0018】ケアセンタ側には、パーソナルコンピュータ(以後、「パソコン」という)20が設けられている。パソコン20は、制御装置31を介してISDN10に接続されている。制御装置31は、パソコン20から送られてきた質問の内容を示す文字情報と、ダウンコンバータ32からの画像情報とを患者側の制御装置41へ送信する。また、制御装置41から質問の回答を示す値が送られてきたら、その情報をパソコン20に入力する。ダウンコンバータ32は、パソコン20と制御装置31との双方に接続されている。このダウンコンバータ32は、パソコンから出力された画像信号を、カラーテレビ放送の伝送信号に変換し、制御装置31に渡す。カラーテレビの伝送信号としては、例えばNTSC(National Television System Committee)がある。さらに、ケアセンタ側にはビデオカメラ33が用意されている。ビデオカメラ33は、医者34の画像を撮影し、その画像をパソコン20に入力するために使用される。

【0019】患者宅側では、制御装置41がISDN10に接続されている。制御装置41には、テレビ42、カラーCCD(Charge Coupled Device)カメラ43及び通信用操作部44が接続されている。制御装置41は、ISDN10を介してケアセンタ側から送られてきた画像情報と質問の内容とをテレビ42用の信号に変換して、テレビ42へ送る。また、カラーCCDカメラ43で撮影された患者45の映像が制御装置41に送られると、制御装置41がカラーCCDカメラ43から送られ

た画像信号をデジタル信号に変換して、ケアセンタ側へ送信する。さらに、制御装置41は、通信用操作部44によるキー入力の内容をケアセンタ側へ送信する。

【0020】このような在宅ケア支援システムにおいて、患者の問診を行うために、まず、医者34がビデオカメラ33を用いて、患者への質問状況を録画する。録画した情報は、パソコン20内の記憶装置に格納する。また、パソコン20は、複数の患者に対する問診のスケジュールが登録されている。そして、スケジュールで示された時間になると、パソコン20が自動問診処理を開始する。

【0021】図3は、自動問診処理の概略を示す図である。

【S1】所定の時刻になると、ケアセンタ側のパソコン20が、患者宅へ自動的に電話をかける。

【S2】患者45が、通信用操作部44に設けられた受話器を取る。

【S3】パソコン20が患者への問診事項を特定し、患者宅へ、問診の質問事項と問診用に保存されていた医者34の動画を送る。

【S4】送られてきた動画を制御装置41が受け取り、テレビ42の画面に表示する。この画面の下部には、問診の質問内容が表示されている。また、質問に対する回答の選択肢も、画面に下に表示されている。各選択肢は、通信用操作部44に設けられた操作パッド44aのキーと対応付けられている。

【S5】患者は、通信用操作部44に設けられている操作パッド44aを用いて、問診の質問に対する回答を入力する。その入力値は、制御装置41によってケアセンタへ送信される。

【S6】パソコン20は、患者宅からの回答を受け取り、記憶装置に格納する。ここで、終了のキーが押されたのであれば、パソコン20は自動問診処理を終了する。また、さらに別の質問があれば、その質問用の画像が患者宅へ送信される。このような質問を繰り返すことで、患者の問診を自動的に遂行することができる。このとき、問診の回答によっては、さらに詳細な症状を問診する必要がある。そこで、最初に予定していた問診が終了すると、続けて以下の処理が行われる。

【0022】図4は、症状別自動問診処理の概略を示す図である。

【S11】ケアセンタ側のパソコン20は、患者宅から送られてきた回答の内容を解析し、症状の切り分けを行う。

【S12】パソコン20は、症状に応じて用意してある問診表の中から、ステップS11で判断した症状に合致する問診集を抽出する。そして、抽出した問診集に設定されている問診の内容を、順次患者宅へ送信する。

【S13】症状に応じた質問を受け取った患者宅側の制御装置41は、質問の内容をテレビの画面に表示する。

【S14】患者が操作パッド44aを用いて回答を入力すると、その内容がケアセンタに送られる。

【S15】パソコン20は、患者宅からの回答を受け取り、記憶装置に格納する。

【0023】以下に、センタ側のパソコン20で行われる処理内容について、詳しく説明する。まず、患者毎の問診スケジュール設定方法について説明する。問診スケジュール設定は、安心コール設定画面を用いて行われる。

【0024】図5は、安心コール設定画面を示す図である。これは、1人の患者「患者A」に対する安心コール設定画面50である。なお、安心コール設定画面50による設定は、患者の健康状態の把握に限らず、患者とコミュニケーションを取ったり、情報を提供するためにも用いられる。

【0025】安心コール設定画面50では、1週間の曜日毎に問診の予定を設定できる。さらに、1日を午前、午後、夜間の3つの時間帯に区切っている。午前は午前0時から午前12時間で、午後は午後0時から午後6時まで、夜間は午後6時から午後12時までである。このように区切られた時間帯毎に、問診時間設定領域51が設けられている。

【0026】安心コール設定画面50の下部には、ボタン52～58が設けられている。「OK」と表記されたボタン52が押されると、画面上に設定されている内容が確定し、安心コール設定画面50が閉じる。「キャンセル」と表記されたボタン53が押されると、設定内容を更新せずに安心コール設定画面50が閉じる。「禁止日設定」と表記されたボタン54が押されると、自動問診を禁止する日付の設定画面が表示される。その画面内で問診の禁止日を設定すれば、安心コール設定画面50で問診のスケジュールが登録されていても、禁止日の自動問診は行われない。例えば、患者の外出日が予め分かっているならば、その日を禁止日とする。「複写」と表記されたボタン55が押されると、設定内容の複写先入力画面が表示される。その画面内で複写先を入力すれば、その時点で指定されていた情報がメモリに一時的に格納される。「張り付け」と表記されたボタン56が押されると、「複写」のボタン55が押されることによってメモリに格納されていた情報が、その時点で指定されている領域に設定される。「削除」と表記されたボタン57が押されると、その時点で指定されている領域の内容が削除される。「全削除」と表記されたボタン58が押されると、安心コール設定画面50に設定されている内容が全て削除される。

【0027】このような安心コール設定画面50で問診時刻を設定するには、パソコン20に接続されたマウスを操作し、マウスポインタを目的の時間帯の領域へ移動する。そして、マウスのボタンをクリックすると、安心コール時刻入力画面が表示される。

【0028】図6は、安心コール時刻入力画面を示す図である。安心コール時刻入力画面60には、開始時刻入力部61が設けられている。開始時刻入力部61には、午前と午後とを選択するためのチェックボックス61a、61bが設けられている。そのチェックボックス61a、61bの右には、「何時」を設定するためのテキストボックス61cと、「何分」を設定するためのテキストボックス61dが設けられている。

【0029】開始時刻入力部61の下には、再生画像指定部62が設けられている。再生画像指定部62には、画像ファイルのファイル名を入力するためのテキストボックス62aがある。その右には、「参照」と表記されたボタン62bが設けられており、このボタン62bが押されると、ハードディスク装置等の記憶装置に格納されているファイル名を参照することができ、そこで選択したファイルのファイル名がテキストボックス62aに設定される。ボタン62bの右側には「テスト再生」と表記されたボタン62cが設けられている。このボタン62cが押されると、テキストボックス62aで指定されたファイルの動画が再生される。

【0030】再生画像指定部62の下には、問診内容指定部63がある。問診内容指定部63には、安心コール（患者宅へ電話をかけ、情報を提供するだけのサービス）の後に問診を行うか否かのチェックボックス63aが設けられている。このチェックボックス63aをチェックすることで、安心コールに続けて、自動問診を行うことができる。チェックボックス63aの下には、問診の種類を入力するためのテキストボックス63bが設けられている。このテキストボックス63bに問診の種類を入力すれば、該当する自動問診が行われる。

【0031】安心コール時刻入力画面60の下部には、2つのボタン64、65が設けられている。「OK」と表記されたボタン64が押されると、安心コール時刻入力画面60に設定されている内容が、安心コール設定画面に登録される。

【0032】このような安心コール時刻入力画面60において、開始時刻、再生画像、問診の種類等の項目を入力し、「OK」のボタン64を押せば、入力した内容が安心コール設定画面50に登録される。

【0033】なお、再生画像としては、様々な動画を設定することができる。例えば、町の様子を撮影した動画を設定してもよい。外出できない患者へ町の様子を見せてあげれば、社会からの隔絶感を和らげることができる。

【0034】また、問診の種類は次のように分かれている。図7は、問診集の分類を示す図である。初期段階の問診として、基本問診71と個別問診72とがある。基本問診71には、「熱はありませんか」のようなごく一般的な質問が設定されている。個別問診72には、患者個別の質問が設定されている。さらに、症状別の詳細問

診73~79が用意されている。

【0035】このような各種問診集がパソコン20の記憶装置に格納された状態で、1人の患者「Aさん」に対する自動問診を行う際のパソコン20内で行われる処理の流れを以下に示す。

【0036】図8は、パソコンでの自動問診の流れを示す図である。

【S21】ケアセンタ側の医者等のスタッフが、図5、図6に示した画面によって安心コールのスケジュールを設定する。設定内容は、コール時刻、再生映像、質問項目等である。

【S22】パソコン20は、設定された安心コールの時刻になったか否かを常に監視し、安心コールの時刻になると、Aさんの以前のバイタルサインデータ（過去に行った問診あるいは実際の健康診断等から取得した健康状態を示す情報）をチェックする。バイタルサインデータは、血圧、脈拍、体温、心電、尿糖等である。その結果、異常がなければ、予め設定された基本問診や個別問診を選択する。もし、異常が見つければ、症状に応じた問診集を選択する。例えば、血圧に異常が見つければ、循環器の症状に関する問診集を選択する。

【S23】ステップS22で選択した問診集を、問診項目として決定する。

【S24】Aさん宅に電話をかける。

【S25】Aさんが受話器を取るのを待ち、問診を開始する。

【S26】問診項目として症状別の問診が決定していたのであれば、その問診を行う。

【S27】問診項目が基本問診に決定されていれば、基本問診を行う。

【S28】問診項目が個別問診に決定されていれば、個別に用意されている問診を行う。

【S29】基本問診若しくは個別問診の回答の内容を解析し、異常がないかどうかを判断する。異常が見つかった場合には、その症状に応じた詳細問診を選択する。例えば、泌尿器系の疾患を示すような回答が返された場合には、泌尿器の症状に関する詳細問診77を選択する。

【S30】ステップS29で詳細問診が選択された場合には、該当する問診を行う。

【S31】実施された問診の回答を、記憶装置に記録する。

【0037】このようにして、自動問診が行われる。記録された回答は、全て記録されるため、パソコン20を操作する医者が自由に参照することができる。図9は、問診記録表示画面を示す図である。問診記録表示画面80には、患者情報表示部81が設けられている。患者情報表示部81には、在宅登録者番号、患者名、問診日、開始/終了時刻の各情報が表示されている。

【0038】患者情報表示部81の下には、回答表示部82が設けられている。回答表示部82には、問診の順

番に沿って、問診内容と、その問診に対する回答の選択肢が表示されている。回答の選択肢の中で、白黒の反転表示されている部分が、実際に患者が選択した回答である。また、回答表示部82の表示内容は、重要度に応じて色分けして表示されている。図の例では、最重要な問診は赤色、重要な問診は紫色、やや重要な問診は黄色、普通の問診は黒色である。このように、重要な問診の色を変えて強調表示することで、問題のある回答を一目で認識することができる。

【0039】回答表示部82の下には、診断結果表示部83が設けられている。診断結果表示部83には、問診の回答を解析した結果が表示されている。診断結果表示部83の表示内容も回答表示部82と同様に、重要度に応じて色分けして表示される。

【0040】問診記録表示画面80の右下には、「閉じる」と表記されたボタン84が設けられており、このボタン84が押されると、問診記録表示画面80が閉じる。このような問診記録表示画面80は、医者がパソコン20へ指令することで表示させることもできるが、診断結果に基づいて自動的に表示させることもできる。例えば、診断結果で最重要と判断された場合には、問診記録表示画面80をパソコン20の表示装置に表示する。

【0041】以上のように、本発明の自動問診システムを在宅ケア支援システムに適用することにより、患者毎の問診を自動的に行うことができる。その結果、ケアセンタ側に待機する医者やスタッフの負担が軽減される。これは、今後の高齢者の増加に伴うヘルパーの絶対数不足への対処方法として有効である。

【0042】しかも、患者毎に自動問診のスケジュールが設定できるため、独居生活の高齢者等の生活リズムを作るのに役立てることができる。すなわち、自動問診のスケジュールを各患者の起床時刻に合わせれば、毎朝同じ時刻に患者側に電話がかけられる。これにより、患者は規則的な生活を送ることができる。しかも、自動問診の際には、前もってビデオ撮りした画像を使用するため、ケアセンタにヘルパー等のスタッフが待機している必要はない。すなわち、ケアセンタ側の無人運転が可能となり、保健婦やヘルパーの人手不足を解消することができる。

【0043】また、問診の質問事項と回答の選択肢を画面に表示するようにしたため、患者は、予め用意された回答項目に対応するキーパッドを押すだけでよい。このように非常に簡単に回答を入力できることにより、高齢者のような新しい機械へ抵抗を持っている患者であっても、問題なく回答を入力することができる。なお、患者宅側の制御装置に音声認識機能を持たせることで、音声によって回答を入力することもできる。

【0044】また、患者宅へ送信する画像は任意に設定可能であるため、自動問診と同時に様々な情報を提供することができる。例えば、患者毎に適合したリハビリ情



報を送信したり、地域のイベント情報、検診情報、ニュース、町の様子、知人からのメッセージ等の各種情報を患者宅のテレビへ表示させることができる。

【0045】なお、上記のパソコン20で行われる処理機能は、コンピュータで読み取り可能な記録媒体に記録されたプログラムに記述されており、そのプログラムをパソコン20に実行させることで実現される。コンピュータで読み取り可能な記録媒体としては、磁気記録装置や半導体メモリ等がある。市場に流通させる場合には、CD-ROM(Compact Disk Read Only Memory)やフロッピー（登録商標）ディスク等の可搬型記録媒体にプログラムを格納して流通させたり、ネットワークを介して接続されたコンピュータの記憶装置に格納しておき、ネットワークを通じて他のコンピュータに転送することもできる。コンピュータで実行する際には、コンピュータ内のハードディスク装置等にプログラムを格納しておき、メインメモリにロードして実行する。

【0046】最後に、本発明の実現するためのパソコン20のハードウェア構成について説明する。図10は、パソコンのハードウェア構成図である。このパソコンは、CPU(Central Processing Unit)21を中心に構成されている。CPU21は、メモリ22に記憶されたプログラムに基づいて各種処理を実行するとともに、バス28を介して接続された各種機器を制御する。バス28には、次のような周辺機器が接続されている。

【0047】ディスプレイコントローラ23は、CPU21から送られてくる描画命令にしたがって表示画像を生成し、生成した画像を表示装置23aに送る。ディスプレイコントローラ23に接続された表示装置23aは、ディスプレイコントローラ23から送られた画像を画面に表示する。

【0048】入力機器インタフェース24は、キーボード24aやマウス24bが接続されており、キーボード24aやマウス24bからの入力信号をCPU21へ転送する。

【0049】通信インタフェース25は、ケアセンタ側の制御装置に接続されており、制御装置との間のデータ通信を制御する。すなわち、CPU21から送られたデータを制御装置へ転送するとともに、制御装置から送られてきたデータを受け取りCPU21に渡す。

【0050】HDD(Hard Disk Drive)コントローラ26には、ハードディスク装置等の記憶装置26aが接続されており、記憶装置26aへのデータの入出力を制御する。記憶装置26aには、CPU21が実行すべきシステムプログラム、自動問診スケジュールデータ、問診表、自動問診プログラム等が格納されている。

【0051】ビデオキャプチャボード27は、ビデオカメラや制御装置から送られるビデオ信号をデジタルの画像データに変換する。変換された画像データは、記憶装置26aに格納される。

【0052】このような構成のパソコン20で自動問診プログラムを実行することで、パソコン20を用いた自動問診システムを構築することができる。ところで、上記の説明では、ケアセンタ側からの電話によって自動問診が行われる場合について説明しているが、患者からケアセンタに電話して自動問診を行うこともできる。その場合、ケアセンタ側のパソコン20は、患者宅の電話番号等によって、どの患者からの電話なのかを判断する。患者を特定したら、その患者のバイタルサインデータ等に基づいて問診項目を決定し、自動問診を行う。この場合においても、ケアセンタ側に医者やヘルパーが待機している必要はない。

#### 【0053】

【発明の効果】以上説明したように本発明の自動問診システムでは、質問項目決定手段により回答者毎の質問項目を決定し、その質問項目によって回答者との間の問診を自動的に行うようにしたため、自動質問装置側は無人で運用できるとともに、回答者との間の個別적인問診を行うことができる。

【0054】また、本発明の自動質問装置では、質問項目決定手段により回答者毎の質問項目を決定し、その質問項目の質問を回答装置へ送信するようにしたため、回答者に対する個別적인質問を自動的に行い、その回答を得ることができる。

【0055】また、本発明の自動質問プログラムを記録したコンピュータ読み取り可能な記録媒体では、記録された自動質問プログラムをコンピュータに実行させることにより、質問項目決定手段により回答者毎の質問項目を決定し、その質問項目の質問を回答装置へ送信するような処理をコンピュータに行わせることが可能となる。

#### 【図面の簡単な説明】

【図1】本発明の原理構成図である。

【図2】在宅ケア支援システムの構成を示す図である。

【図3】自動問診処理の概略を示す図である。

【図4】症状別自動問診処理の概略を示す図である。

【図5】安心コール設定画面を示す図である。

【図6】安心コール時刻入力画面を示す図である。

【図7】問診集の分類を示す図である。

【図8】パソコン内での自動問診の流れを示す図である。

【図9】問診記録表示画面を示す図である。

【図10】パソコンのハードウェア構成図である。

#### 【符号の説明】

1 回答装置

1a 質問表示手段

1b 回答送信手段

1c 表示装置

1d 入力装置

2 自動質問装置

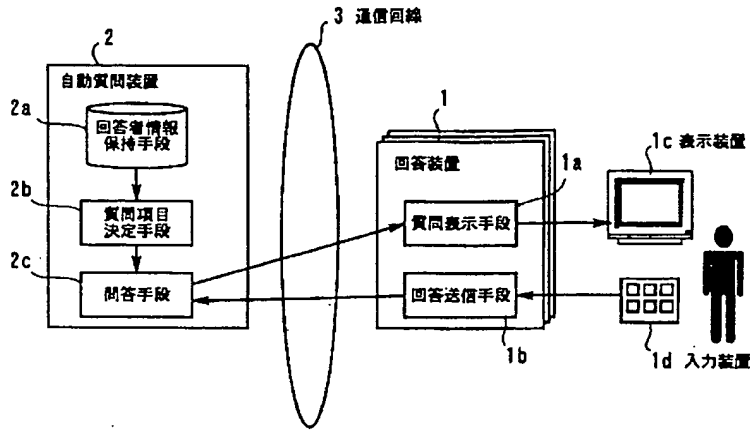
2a 回答者情報保持手段

2b 質問項目決定手段

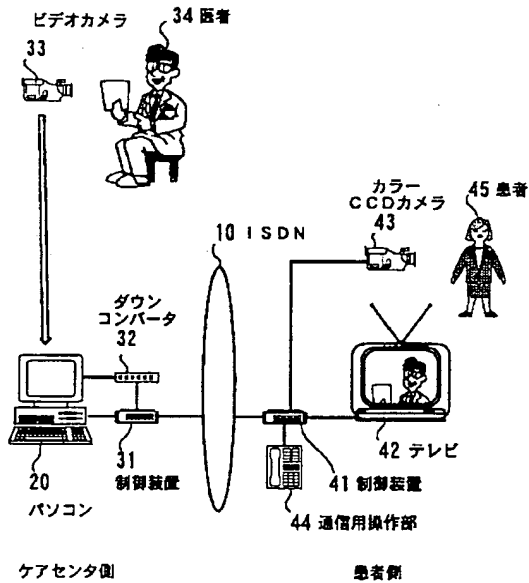
3 通信回線

2c 問答手段

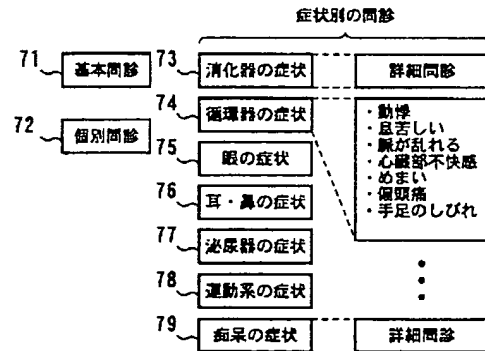
【図1】



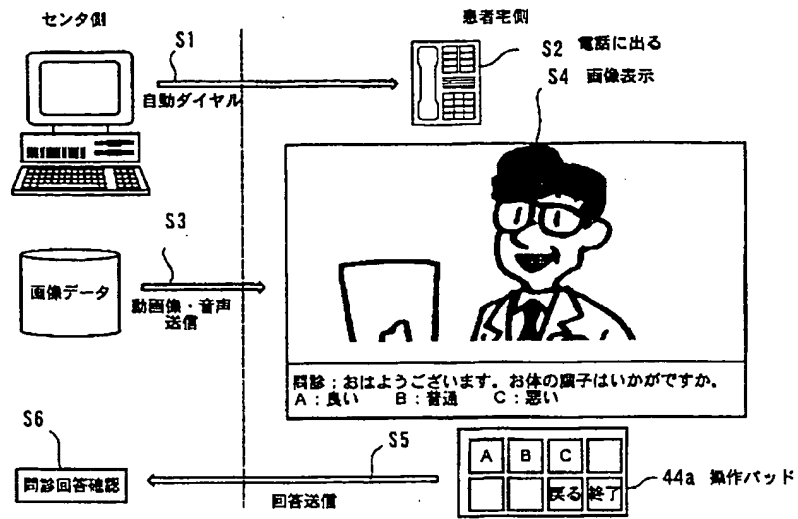
【図2】



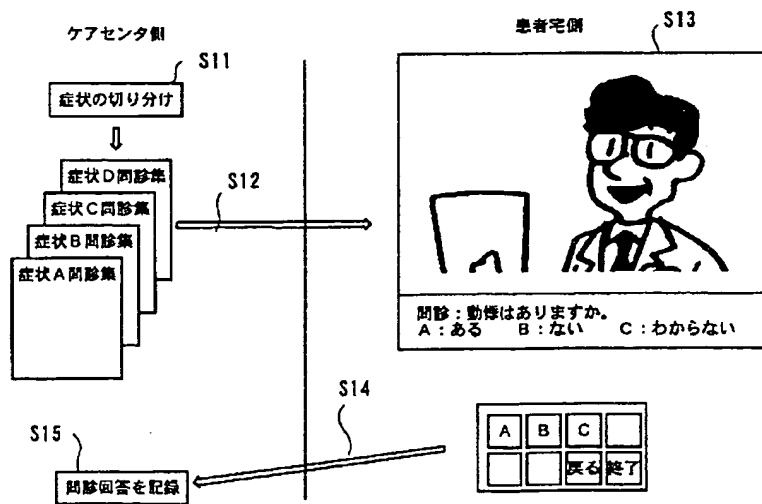
【図7】



【図3】



【図4】



【図5】

50 安心コール設定画面

安心コールの登録		Aさんのスケジュール				
日	月	火	水	木	金	土
	午前07時00分 問診する	午前07時00分 問診する	午前07時00分 問診する	午前07時00分 問診する	午前07時00分 問診する	午前07時00分 問診する
	午後01時00分 問診する		午後01時00分 問診する		午後01時00分 問診する	
			午後08時00分 問診する			
OK	キャンセル	禁止日設定	複写	張り付け	削除	全削除

52      53      54      55      56      57      58      51

【図6】

60

安心コール時刻入力画面

61 開始時刻

61a ● 午前 61b ○ 午後

61c 00 61d 00

62 再生画像

62a ファイル名: 62b 参照 62c テスト再生

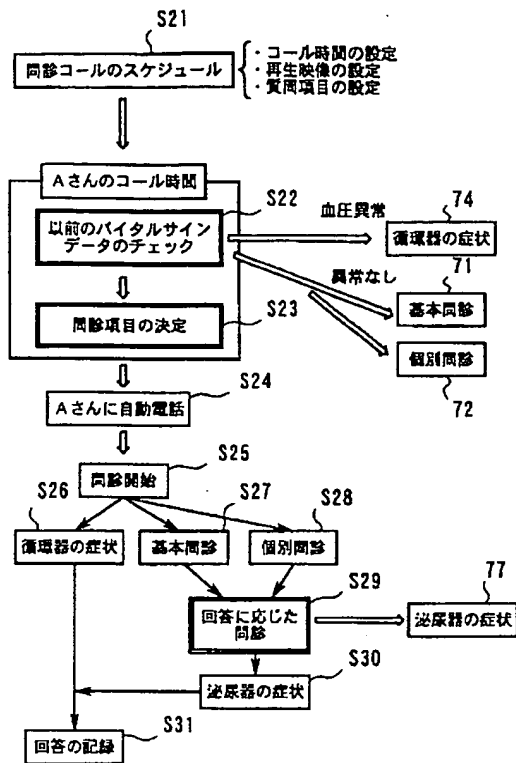
63 問診

63a ■ 安心コール後、問診を行う

問診の種類: 63b

OK 64 キャンセル 65

【図8】



【図9】

図9は、同診記録の画面（80）を示す図である。

画面（80）には、同診記録（81）の情報が表示されている。画面の右上には、色の説明が記載されている。

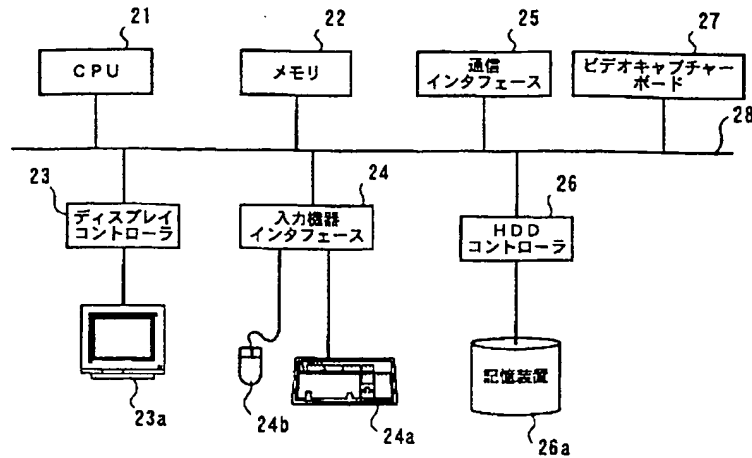
画面の下部には、診断結果（82）と「閉じる」ボタン（84）が表示されている。

順番	問診内容	回答-A	回答-B	回答-C	その他の回答
0	おはようございます。体の調子はいかがですか。	悪い	普通	悪い	
1	今日、外出しますか。	する	しない	わからない	
2	心配事はありませんか。	ある	ない	わからない	
3	町の様子を見たいですか。	見ない	見たくない	わからない	
4	町の様子です。	まだみる	もう見ない	わからない	
5	利用者へ一言	終了			終了

診断：重要

閉じる

【図10】



## 【手続補正書】

【提出日】平成11年7月21日(1999. 7. 21)

## 【手続補正1】

【補正対象書類名】明細書

【補正対象項目名】請求項7

【補正方法】変更

【補正内容】

【請求項7】 前記重要度判別手段によって重要と判別された問答を強調表示しながら問答結果を画面表示する問答結果表示手段をさらに有することを特徴とする請求項記載の自動質問装置。

## 【手続補正2】

【補正対象書類名】明細書

【補正対象項目名】0026

【補正方法】変更

【補正内容】

【0026】安心コール設定画面50の下部には、ボタン52～58が設けられている。「OK」と表記されたボタン52が押されると、画面上に設定されている内容が確定し、安心コール設定画面50が閉じる。「キャンセル」と表記されたボタン53が押されると、設定内容を更新せずに安心コール設定画面50が閉じる。「禁止日設定」と表記されたボタン54が押されると、自動問診を禁止する日付の設定画面が表示される。その画面内で問診の禁止日を設定すれば、安心コール設定画面50で問診のスケジュールが登録されていても、禁止日の自動問診は行われない。例えば、患者の外出日が予め分かっているならば、その日を禁止日とする。「複写」と表記されたボタン55が押されると、設定内容の複写先入力画面が表示される。その画面内で複写先を入力すれば、そ

の時点で指定されていた情報がメモリに一時的に格納される。「張り付け」と表記されたボタン56が押されると、「複写」のボタン55が押されることによってメモリに格納されていた情報が、その時点で指定されている領域に設定される。「削除」と表記されたボタン57が押されると、その時点で指定されている領域の内容が削除される。「全削除」と表記されたボタン58が押されると、安心コール設定画面50に設定されている内容が全て削除される。

## 【手続補正3】

【補正対象書類名】明細書

【補正対象項目名】0036

【補正方法】変更

【補正内容】

【0036】図8は、パソコンでの自動問診の流れを示す図である。

【S21】ケアセンタ側の医者等のスタッフが、図5、図6に示した画面によって安心コールのスケジュールを設定する。設定内容は、コール時刻、再生映像、質問項目等である。

【S22】パソコン20は、設定された安心コールの時刻になったか否かを常に監視し、安心コールの時刻になると、Aさんの以前のバイタルサインデータ(過去に行った問診あるいは実際の健康診断等から取得した健康状態を示す情報)をチェックする。バイタルサインデータは、血圧、脈拍、体温、心電、尿糖等である。その結果、異常がなければ、予め設定された基本問診71や個別問診72を選択する。もし、異常が見つければ、症状に応じた問診集を選択する。例えば、血圧に異常が見つければ、循環器の症状に関する問診集74を選択する。

〔S23〕ステップS22で選択した問診集を、問診項目として決定する。

〔S24〕Aさん宅に電話をかける。

〔S25〕Aさんが受話器を取るのを待ち、問診を開始する。

〔S26〕問診項目として症状別の問診が決定していたのであれば、その問診を行う。

〔S27〕問診項目が基本問診に決定されていれば、基本問診を行う。

〔S28〕問診項目が個別問診に決定されていれば、個別に用意されている問診を行う。

〔S29〕基本問診若しくは個別問診の回答の内容を解析し、異常がないかどうかを判断する。異常が見つかった場合には、その症状に応じた詳細問診を選択する。例えば、泌尿器系の疾患を示すような回答が返された場合には、泌尿器の症状に関する詳細問診77を選択する。

〔S30〕ステップS29で詳細問診が選択された場合には、該当する問診を行う。

〔S31〕実施された問診の回答を、記憶装置に記録する。

【手続補正4】

【補正対象書類名】明細書

【補正対象項目名】0037

【補正方法】変更

【補正内容】

【0037】このようにして、自動問診が行われる。回答は、全て記録されるため、パソコン20を操作する医師が自由に参照することができる。図9は、問診記録表示画面を示す図である。問診記録表示画面80には、患者情報表示部81が設けられている。患者情報表示部81には、在宅登録者番号、患者名、問診日、開始／終了時刻の各情報が表示されている。

【手続補正5】

【補正対象書類名】明細書

【補正対象項目名】0042

【補正方法】変更

【補正内容】

【0042】しかも、患者毎に自動問診のスケジュールが設定できるため、独居生活の高齢者等の生活リズムを作るのに役立てることができる。すなわち、自動問診のスケジュールを各患者の起床時刻に合わせれば、毎朝同じ時刻に患者側に電話がかけられる。これにより、患者は規則的な生活を送ることができる。しかも、自動問診の際には、前もってビデオ撮りした画像を使用するた

め、ケアセンタにヘルパー等のスタッフが待機している必要はない。すなわち、ケアセンタ側の無人運転が可能となり、保健婦やヘルパーの人手不足を解消することができる。

【手続補正6】

【補正対象書類名】明細書

【補正対象項目名】0046

【補正方法】変更

【補正内容】

【0046】最後に、本発明を実現するためのパソコン20のハードウェア構成について説明する。図10は、パソコンのハードウェア構成図である。このパソコンは、CPU(Central Processing Unit)21を中心に構成されている。CPU21は、メモリ22に記憶されたプログラムに基づいて各種処理を実行するとともに、バス28を介して接続された各種機器を制御する。バス28には、次のような周辺機器が接続されている。

【手続補正7】

【補正対象書類名】明細書

【補正対象項目名】0051

【補正方法】変更

【補正内容】

【0051】ビデオキャプチャボード27は、ビデオカメラ33や制御装置31から送られるビデオ信号をデジタルの画像データに変換する。変換された画像データは、記憶装置26aに格納される。

【手続補正8】

【補正対象書類名】明細書

【補正対象項目名】0052

【補正方法】変更

【補正内容】

【0052】このような構成のパソコン20で自動問診プログラムを実行することで、パソコン20を用いた自動問診システムを構築することができる。ところで、上記の説明では、ケアセンタ側からの電話によって自動問診が行われる場合について説明しているが、患者側からケアセンタに電話して自動問診を行うこともできる。その場合、ケアセンタ側のパソコン20は、患者宅の電話番号等によって、どの患者からの電話なのかを判断する。患者を特定したら、その患者のバイタルサインデータ等に基づいて問診項目を決定し、自動問診を行う。この場合においても、ケアセンタ側に医師やヘルパーが待機している必要はない。

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